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FACULTY OF EDUCATION
The University of Alberta

RESEARCH AND DEVELOPMENT IN EDUCATION

— THE HRRC EXPERIENCE —

Although educational research in Alberta has a history which spans several decades, it was only with the creation of the Human Resources Research Council in 1967 that the possibility for concerted research and development activities in education became a reality. In the past few years, HRRC has added a significant new dimension to research in education which complements the work carried out through the efforts of individual scholars, the universities, the Alberta Advisory Committee for Educational Studies, professional associations, school districts, and other agencies. It would probably not be unfair to previously existing efforts and agencies to state that HRRC has both added to the research capability as well as stimulated educational research within the Province. The major purpose of this theme issue of AJER is to bring some of the results of HRRC's experiences with research and development activities to the attention of our readers.

The intent of this issue is not just to inform; it is also to share learnings. The experience of a new organization in launching activities which involve researchers, administrators, policy makers, teachers, and the public in new types of relationships hold many lessons — lessons for those who have yet to become involved in similar activities as well as for those who are already engaged in research and development. Although the projects described in this issue have not yet been completed — and one is still in the "embryonic" stage — the persons most closely associated with them have consented to share their experiences and tentative impressions. AJER is grateful to the contributors for taking on the task of preparing reports which are all the more difficult to present because of the particular timing.

The seven articles in this issue focus in one way or another on a number of problem areas: organizing for research and development, initiating specific projects, managing programs, evaluating research and development projects, and placing such activities within a social research framework. In the first article E. J. Ingram outlines some operational principles and the substantive focus of HRRC's programs in education; he also discusses some general organizational problems. Although J. O. Fritz refers specifically to the development phase of one mission (Humanization of Learning), both W. G. Roberts and F. D. Oliva also give attention to design and development in their discussions of Project SEARCH and the IPI Project respectively. The Roberts and Oliva articles also present insights into approaches and problems associated with the management of specific projects. L. W. West and T. O. Maguire address themselves to the evaluation of these same projects and, in this context, raise some general issues in the evaluation of research and development activities. In the concluding article, L. W. Downey examines the current situation of social research in general and suggests some new directions as well as needed developments.

These articles summarize activities which involved extensive conceptualization and planning, implementation work, and re-conceptualization. We trust that our readers will find both the descriptions of the projects and the insights which they have yielded to be valuable additions to the Canadian literature on research and development in education.

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Editor

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HRRC's Research and Development Programs in Education

HRRC was created "... to undertake educational, social, economic, and other research relating to and affecting the development and conservation of human resources in Alberta." The principles of complementarity, mission-orientation, and systematic management were adopted to guide the selection and conduct of HRRC's programs. The educational programs focus on the personalization of teaching and learning, and the planning and decision making processes. Several problems resulting from the wide range of expectations held for HRRC and the difficulties of designing and conducting mission-oriented programs have arisen. These problems are gradually being solved as the organization gains experience in planning and conducting mission-oriented research. A major set of problems presently receiving the attention of HRRC centers around the role of research and development in educational improvement. Of primary concern is the development of appropriate conceptual and operational linkages among the functions of policy making, policy research, planning, research and development, dissemination, and the implementation of policy and plans.

The Human Resources Research Council was created by an Act of the Alberta Legislature in March, 1967 "... to undertake educational, social, economic and other research relating to and affecting the development and conservation of human resources in Alberta . . . (An Act to Establish The Alberta Human Resources Research Council)." Emphasis was placed upon the facilitation and coordination of research efforts within the province; the development, revision, assessment and dissemination of plans, materials and procedures relating to human resource development; the training of persons engaged in human resources research; the undertaking of developmental studies in education; and the creation of a general public awareness of human resource problems and needs.

HRRC planners and policy makers faced a series of difficult tasks in coming to grips with the mandate and in selecting the initial substantive focus for its research programs. Because HRRC's mandate covers all types

of research which relate to human resources development, its approaches and structures were developed to accommodate this total field of concern. This article, however, is limited to a description and analysis of HRRC's Research and Development program in education, which was the major initial focus of the Council.

Operational Principles

The focus of the initial educational program undertaken by HRRC was sharpened through the application of three principles which emerged from a study of R and D programs conducted elsewhere and from the early experience of HRRC itself. These were the principle of complementarity, the principle of mission orientation, and the principle of systematic management.

The Principle of Complementarity

Educational R and D was introduced into the United States by means of a large number of fragmented, overlapping and uncoordinated programs undertaken by numerous universities, school systems and research agencies (Chase, 1968). Dissatisfaction with the results of this approach led the U.S. government to take steps to bring more order into educational improvement programs. The establishment of the Research and Development Center program, the Regional Educational Laboratory program, and the National Institute for Education represent in large measure the efforts of the U.S. government to bring coordination and complementarity of effort into educational improvement activities in that country. In general, the Centers concentrate on problem-oriented research whereas the Laboratories concentrate on the development and dissemination of instructional systems or other educational products. The National Institute for Education has a mandate to coordinate and give leadership to all programs designed to improve education (Marland, 1971).

The Act establishing HRRC makes it abundantly clear that duplication of research should be avoided and that coordination of programs should be attempted. This principle of complementarity was observed in HRRC's education program in four major ways — research presently underway in Alberta was not duplicated by HRRC, research which could be conducted as well or better by some other agency was not undertaken by HRRC, programs were undertaken in cooperation with other groups, and wherever possible the research abilities of personnel in other organizations were used by HRRC.

Mission Orientation

Following the American decision in the 1950's to support education as an instrument of national policy in international affairs, increased attention was given to the effectiveness and efficiency of educational improvement programs in furthering American policy (Boyan and Mason, 1968). It soon became evident that the gap between "knowledge production" and "knowledge utilization" in education was just as great, if not greater, than it was in other social service delivery systems. It also became evident that educational improvement efforts, in addition to being

limited, were fragmented and lacked clear direction. Many programs also lacked adequate conceptual, operational and evaluative designs.

A search for more adequate programs resulted in a rapid acceleration of the R and D approach to educational improvement. Although the role of R and D in medicine, agriculture, physical science, industry and national defense was well established early in the 1950's, an interest in the application of R and D to education did not become evident until the mid-1950's. The initial R and D concepts in education were based on the standard business and industrial model which contain three sub-models: fundamental research, applied research, and development.

Fundamental research is primarily concerned with the search for scientific knowledge with little regard for the application of this knowledge to the generation of a specific useful product. However, the results of this type of research usually serve as the fountainhead for future scientific and engineering endeavor in the evolution of useful products. Applied research combines, refines, and extends the results of fundamental research to obtain practical technology which will serve a useful purpose or generate a useful product. In the latter case, applied research often results in the design of a prototype device or process. Developmental research is concerned with the refinement of applied research results and the integration of these with production and processing methods which will most efficiently and economically generate the product for market. (Jackson and Spurlock, 1966, pp. 21-22).

Educational researchers were familiar with fundamental and applied research; however, they approached developmental research with caution. Consequently, until recently, developmental research has been given short shrift in most R and D programs. Because the initial models were divided into two components — research and development — the Research and Development institutions tended to emphasize either one or the other, with most selecting research for their major emphasis. The R and D center program in the United States, for example, tended to emphasize the research side of the continuum. Subsequently the regional educational laboratory program was initiated to help balance the scales; however, fragmentation still remained. A fully integrated approach to R and D was difficult to achieve and conflicts and jealousies between researchers and developers began to develop. A similar situation developed in the Ontario Institute for Studies in Education where, initially, responsibility for research and development were delegated to two separate offices.

These early experiences with Research and Development programs led to modifications in the original R and D concept. The systems approach, where education is viewed as a system of interrelated parts affected by its environment, found a home in the R and D movement after it was realized that there was not a simple linear flow from basic research to development as was suggested by the industrial model. The systems model tends to blur the distinction between R and D and integrates both types of activities into systematic problem-oriented or "mission-oriented" inquiry.

The "mission-oriented" approach¹ adopted for HRRC's education pro-

¹ The term "mission-orientation" was borrowed from the American space program.

grams consists of several integrating concepts. The research programs are to have clear social purposes and well defined goals which can be achieved over specified time periods. Each program is to be based on a sound conceptual rationale and a defensible research and evaluation design. The interdisciplinary approach to investigating social problems is also an important element in "mission-oriented" inquiry.

Following clarification of the concept of mission-orientation, HRRC's education projects were consolidated and reformulated to meet the specifications of the concept.

The Principle of Systematic Management

A major criticism of the uncoordinated, fragmented, overlapping approach to educational research is that it has a minimal impact on policy and practice. This can be explained in part by the lack of an adequate problem or mission-orientation. However, inadequate planning and management systems, both for individual projects and for the total educational improvement movement, have also resulted in inefficiencies and disappointing results. According to Chase (1971) the shortage of personnel with R and D management ability, and inadequate planning and coordination of programs are major problems in most R and D organizations and in the total educational improvement movement. This need for more sophisticated planning and management systems became obvious as larger and more complex programs were initiated.

At an early stage in its development the Educational Studies area of HRRC decided to establish a research management and coordination system geared to maximize the effectiveness and efficiency of its program.

Identification of Needs. The first component of this management system is an Education Advisory Committee made up of representatives from all major educational organizations in Alberta. This committee has three major terms of reference — to advise HRRC on areas of needed research in Alberta; to review HRRC's educational R and D programs from the point of view of relevance to provincial needs; and to act as a liaison mechanism between HRRC and the educational community. Although HRRC receives inputs and feedback from many sources, the Education Advisory Committee is certainly one of the major ones.

Mission Planning. After an area of research is tentatively decided upon, a general proposal is called for. In many cases, this proposal is prepared by the person or persons suggesting the idea. In other cases, it is prepared by HRRC staff, if possible, in collaboration with those who might be asked to conduct the project. The proposal format calls for an elaboration of the mission's rationale, objectives, end-products, target dates, evaluation plans, operational and research design, management system, and budget.

Mission Management and Control. Following approval of the mission proposal, the budget is established and a mission head named. In most cases, mission heads are seconded from other agencies on either a part-time or a full-time basis. Mission heads are responsible for the conduct of their programs and for the staff of their programs. They have considerable autonomy to conduct the mission within the terms of their con-

tracts, the goals, design and budget of the project and the general policies of HRRC; however, modifications in the goals and budget, and major modification in design require the approval of HRRC. Staff and consultants are appointed by HRRC on recommendation of the mission head.

Each mission head is required to submit quarterly reports to HRRC. These reports contain three basic sections: progress since last report, quarterly expenditures and estimates for the next quarter, and recommendations for modifications in design or budget. There is also considerable face to face communication between HRRC's management staff and mission heads during the life of a mission.

Program Coordination. In order to facilitate the coordination of education programs and to improve the management and research procedures, an R and D Review Board, consisting of all mission heads and senior research staff, has been established. Through this mechanism, mission heads are kept informed of other missions, are able to subject their programs to critical review by other members of the Board, and are able to discuss common problems with one another.

Mission Products. The reports of missions are reviewed by HRRC staff and outside reviewers for four major purposes — to determine the quality of the product; to determine forms of publication and dissemination; to consider policy implications; and, where appropriate, to integrate the products of the various missions.

The production of printed reports is only one form of dissemination and probably not the most effective one for R and D products. Therefore, HRRC has instituted a program to disseminate its products through conferences, seminars, clinics, and short courses. Whenever possible these are conducted by, or in cooperation with, other agencies.

Substantive Focus of R and D Programs

Following an intensive period of analysis which took place after clarification of the operating principles outlined above (complementarity, mission-orientation, and systematic management), a two-dimensional program focus was adopted. One of these dimensions focuses on the substance of the research to be undertaken. The other dimension focuses on the type of research to be undertaken (e.g., curiosity-oriented research or mission-oriented research).

The subject matter of HRRC's educational research programs is divided into two categories. The first focuses on what might be called "the personalization of teaching and learning." This collection of programs, which is concerned primarily with instructional procedures and the organization of schools for instruction, has as its overriding concern the individual human being. It addresses questions related to the development of individuality in a variety of ways.

During the last few years there has been a ground swell of public opinion, especially among the young, demanding that the importance of the individual and the dignity of mankind be the central focus for all educational and social development programs. Educators are also beginning to concern themselves with this problem. Therefore, the nature of

individuality and the development of programs aimed at fostering individuality were selected as a major program area. Of particular concern is the development of individuality in such terms as capacity for self-direction and the willingness and ability to assume social responsibility.

The second substantive focus is on the “planning and decision-making process”. It was decided that attention to this concern was essential if progress in the improvement of education was to be made. The constellation of planning and decision-making concerns centers around processes and mechanisms for future forecasting; for rationally determining goals; for initiating, developing and discovering alternative means of moving toward these goals; for selecting the most efficient, effective and appropriate alternatives for trial; for implementing the alternatives selected; for monitoring and evaluating the operations in terms of the goals of the program; and for correcting the procedures, operations, and objectives on the bases of appropriate and relevant feedback.

Although the basic and applied research which is generally conducted in universities is essential to the long-term improvement of education, the major focus of HRRC’s educational studies is on what is called mission-oriented research and development. This decision is a direct application of the principle of complementarity. In other words, HRRC’s major interest is in developing and testing products, processes, educational methods, and policy alternatives which have real relevance and meaning to practitioners and policy makers.

HRRC is also prepared to assist practitioners and policy makers develop the knowledge and skills necessary to facilitate the effective and efficient planning and operation of educational systems. Therefore, HRRC works very closely with school systems, schools, teachers and other educational decision makers.

Figure 1 depicts HRRC’s major research and development programs in education as they relate to the two-dimensional program focus.

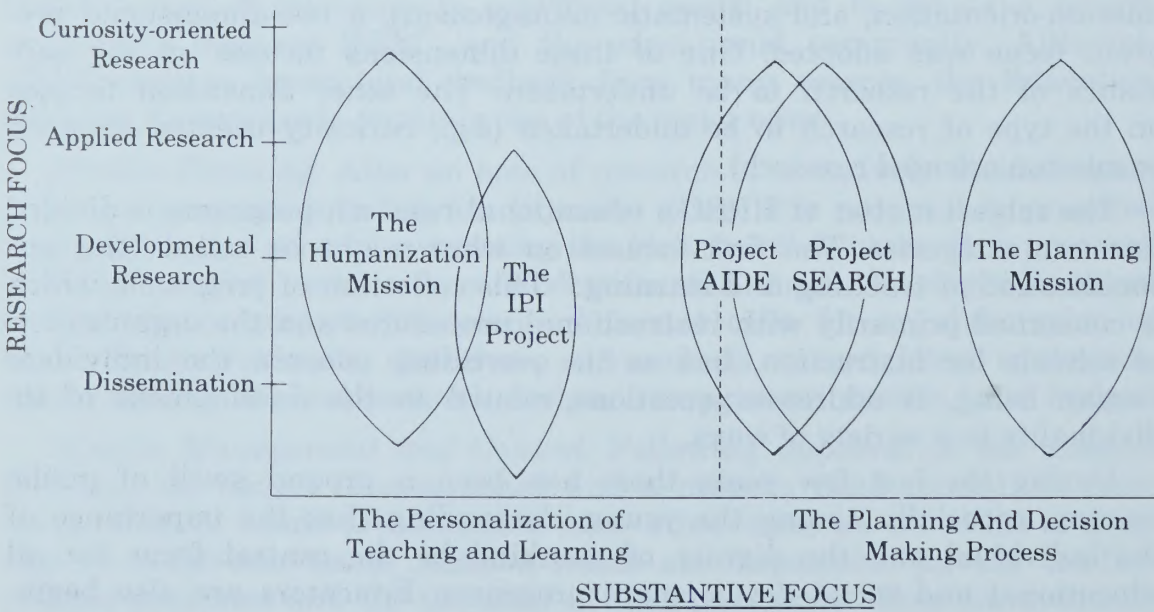


Figure 1. Education Programs of HRRC: A two-dimensional Focus.

An Assessment

Whenever a new sub-system is introduced into an existing system, the functioning of the total system is disrupted and a period of unrest exists until the new sub-system is either rejected or until new roles and relationships are established. This disruption is more intense when the roles of the new sub-system and its relationships with the existing system are not clearly defined and understood.

In 1969 HRRC found itself in the position of a new sub-system with vaguely defined roles and unclear patterns of relationships with the educational system into which it was injected. As a result several problems developed.

Role Expectations

Should HRRC serve the specific needs and interests of the provincial government through policy and institutional research? Some think it should. Should HRRC serve the research interests of university departments and individual professors by acting as a funding agency? Some think it should. Should HRRC concentrate on the specific problems identified by schools and school systems? Some think it should. Should HRRC emphasize basic research? Policy research? Developmental research? Dissemination? Various groups and individuals answer in the affirmative to each of these questions. Should HRRC conduct its own research program or should its major role be to coordinate research being conducted by other agencies? Each of these opinions is held by different groups. In its educational programs HRRC is attempting to serve all of these interests, to some extent at least. However, it has not been able to serve any of them to the extent expected by its various user groups.

HRRC *does not* believe that its major role is to serve directly the immediate interests and needs of any group, including the provincial government. Although HRRC accepts the role of attending to some of these needs, its major role must be that of taking a broader and a deeper perspective on the policy and research problems of the province. This position does not imply that the immediate needs and interests of specific organizations and agencies are not important or vital to the overall needs of the province. However, if a research organization such as HRRC were to devote most of its attention and resources to these immediate needs, the overall result could well be a fragmented and uncoordinated approach to social research in the province.

As described above, HRRC, in its educational programs, has identified, through various means — inputs from educational groups, advisory committees, the educational literature, expressed concerns of governments and input from lay groups — two or three areas of needed research and development. It is attacking these areas through a broad missions approach which includes cooperative activities with other agencies. This approach certainly limits the scope of HRRC's educational research, especially in light of severely limited budgets, and consequently leaves many high priority areas unattended. This situation, as could be expected, has led to some criticism of HRRC; however, HRRC believes that in the intermediate and long-range future, the missions approach to educational

and social problems will produce the best pay-off for the people of Alberta.

The immediate needs and problems of educational agencies within the province, however, have not been left entirely unattended. HRRC has undertaken to conduct this type of research in various ways. It has contracted to do specific research projects for the Alberta Teachers' Association, the Alberta School Trustees' Association, the Department of Education and the Colleges Commission. It is also working cooperatively with other institutions in the province on areas of immediate concern to these organizations.

Role Conflicts

In addition to the problems resulting from the varied role expectations for HRRC, problems of role conflict have also arisen. In its developmental and dissemination programs, is HRRC usurping the role of the Department of Education and school systems? Some believe it is. Is HRRC's decision to conduct its own research and development programs and to second university personnel to work on these programs, rather than emphasizing grants-in-aid and commissioned research, usurping the role of the universities and diverting research funds to itself that should properly go to universities? Some believe it is.

HRRC believes its strategy to mount and manage mission-oriented programs and to use research talent wherever it may be found will produce the highest pay-off for education. However, many of the problems of role conflict and interorganizational relationships remain to be resolved.

Research Management

HRRC's educational studies program consists primarily of research and development projects conducted through the missions approach. Because this approach is relatively new and untried in education, several problems have been encountered.

One set of problems centers around the identification of research programs to be undertaken — especially how research areas are identified and by whom. Traditionally, research problems have been identified by the researcher himself, or by a client who contracts a researcher to conduct a specific study. HRRC has used inputs from researchers, users, Council, Council staff and the literature, to determine the research areas to which it would devote attention; however, no elaborate model for identifying the research needs has been used. This has created many problems and some criticism of HRRC.

HRRC is presently developing a more sophisticated model for identifying research needs. This model, which is being developed through the Human Resources Review project will be used in conjunction with more traditional methods to identify areas in need of research.

Researchers generally determine for themselves the research in which they will become involved. Therefore, HRRC anticipated difficulty in finding researchers prepared to work on projects identified by others. How-

ever, very little difficulty has been encountered in this regard, especially in HRRC's educational research program.

A second set of research management problems centers around the development of mission proposals following the selection of a research area. Who should prepare the proposal? To what extent should the mission goals, procedures, budget, operational and evaluation designs, and time deadlines be specified? How elaborate should the management procedures be? HRRC has pressed for rather elaborate and specific designs for most of its projects and missions; however, because mission management is a new field, some problems have been encountered. At times it is difficult to involve potential mission staff in the development of the mission proposal. This can lead to conflicts between mission staff and the developers of the mission proposal regarding interpretation of intent, design, procedures and the like. When the mission head, and preferably the staff, is involved at an early stage in developing the proposal many of these problems are avoided.

Another set of management problems encountered by HRRC centers around ways and means of staffing its programs. Two methods are used to obtain project staff: secondments from other institutions and short-term employment contracts. Because of the difficulty of obtaining senior researchers on a short-term employment contract, HRRC seconds most of its mission heads and evaluators from universities or other institutions. Although this procedure serves well the interests of HRRC, difficulties have been encountered in obtaining sufficient staff for a large enough portion of their time from the universities. Some university staff members seconded to HRRC on a one-half time or more than a one-half time bases have had difficulties in retaining an identity with their home institutions and in having their secondments renewed for another year. If satisfactory arrangements cannot be made with the universities to solve this problem, HRRC will be forced to find alternative means of staffing many of its research projects.

Traditionally, researchers have either worked alone on research projects or in a collegial relationship with one or two other researchers. This type of arrangement has not produced satisfactory results in large scale projects. The scope and complexity of most mission-oriented programs makes it necessary for a different management system, different role definitions and different relationships to be established. This has raised problems of role conflict, involvement in decision making, academic freedom and the like. However, as researchers gain experience with these new procedures, fewer and fewer problems are arising.

Another management problem relates to budgeting for large-scale mission-oriented programs. Traditionally, the provincial government has budgeted one year at a time. This tradition has created serious problems for HRRC because many of its programs are planned to continue for a three or four year period. Although budget requirements for these programs are known for this total period of time, budget allocations have seldom been based upon the budgetary needs or estimates of on-going programs.

Some problems have been encountered in budget control within pro-

jects; however, most of these have resulted from lack of experience in controlling budgets for mission programs. As HRRC gains experience with these procedures, fewer and fewer problems arise.

The Place of R and D in Educational Improvement

Although HRRC has faced a number of problems created by the varied expectations held by its user groups and by the structures and procedures for mission research management, an emerging set of problems, which will probably be more difficult to overcome, centers around the role of R and D in educational improvement programs.

The research and development movement in education, which literally mushroomed in the United States during the 1960's, was viewed by many educators as a panacea to the problem of moving research into practice. However, by 1970, this rapidly rising spiral of expenditures and confidence in the R and D movement came to an abrupt halt, temporarily at least. Although the restrictions which the U.S. government placed on expenditures affected all research, its major impact was on social research, including education. A basic reason for the restriction of funds seemed to be the disillusionment on the part of some policy makers and critics with the effectiveness of R and D in solving educational problems. The critics claim that there is little evidence that R and D programs have had a visible impact on educational practices and policy; many of them would abandon the R and D movement and start afresh with new structures and new approaches. This has certainly been our tradition in the educational improvement movement. R and D was a "glamour" concept in the 1960's. It did not perform miracles immediately so new glamour concepts began to emerge — future forecasting, policy research, and second generation planning.

The supporters claim that the R and D movement has had several successes. Many new materials, facilities, and procedures have been introduced as a result of R and D programs. New insights into the processes of planned change in education have emerged. New structures and methods of improving education have come about because of experiences with R and D programs, and the pool of research and development personnel has been greatly expanded (Chase, 1971).

In any case the R and D movement has certainly not produced the dramatic results expected of it. One of the major reasons for this has undoubtedly been the unrealistic expectations held for the approach. Another reason is that insufficient time has been given for R and D to prove itself. In business and industry it can take several years to make even a small impact in a narrow field. However, a more basic reason is the lack of adequate linkages between policy making, policy research, planning, research and development, dissemination and implementation. Improved conceptual and operational models are needed to bring about effective linkages among these functions. Future forecasting, policy research, and planning procedures must also be developed to at least the same degree of sophistication that R and D has now reached, if the systems approach to educational improvement is to be effective. These high priority tasks are now being undertaken by HRRC.

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Project SEARCH: Experiential Learning About the Development Process

When the resources of a research organization, a relatively small educational system, and two rural communities are brought together in a collaborative attempt to improve educational opportunity and programs, what might be expected to happen? This article outlines some of the significant events to date in the two-year history of a project which has produced attempts to (1) individualize instructional programs, (2) utilize film making in the teaching of English, (3) make driver training readily available, and (4) strengthen the bonds between the school and the community. Attention is drawn to some of the problem areas and difficulties that have confronted the many persons involved in the project. Though the project will not be terminated until August, 1972, some general observations and suggestions relative to the design and implementation of development projects are offered.

Project SEARCH has meant, and continues to mean, something different for the different people who have been and are currently involved. For the professional educators, it has meant a unique opportunity to design and test modes of instructional practice which promise something better for their students. For the lay persons, it has meant an opportunity to explore ways and means of developing new and more functional relationships between the school and the community. For many, it has meant an increased opportunity to be involved in the decision-making process relative to the local educational enterprise. For the Project staff, it has meant an opportunity to assess the operational requirements for a developmental undertaking of some magnitude. For most, it has meant coping with a challenge demanding of time and energy — one which has produced periods of extreme frustration as well as moments of genuine satisfaction. Above all, Project SEARCH has meant an opportunity to be a part of an endeavor fashioned to improve the educational opportunities for rural youth.

Dimensions of SEARCH

SEARCH is an Alberta Human Resources Research Council (HRRC) sponsored development project which had its genesis in January, 1969, when a decision was made to launch the "Rural High Schools Project" as the first major undertaking in an activity realm designated as "Program 500: Demonstration and Field Testing." The objectives set out for the project, sometimes referred to as Project 501, were:

1. To field test in an Alberta school system a number of innovations which aim at improving the educational opportunities of students attending small high schools. These innovations include self-instruction systems and certain instructional innovations embodied in the multi-campus high school concept.
2. To refine and modify these innovations to meet local circumstances, with a view to recommending their ultimate adoption (Alberta Human Resources Research Council, 1968).

Changes in the organizational structure and personnel of HRRC during the next two months resulted in a significant shift in the proposed project's focus as is indicated by the following statement of objectives. These revised objectives, and their concomitant anticipated outcomes, were issued in mid-March, 1969, and became the guidelines for all subsequent activity.

Objective No. 1

To develop procedures for increasing the capacity of rural communities to expand the educational opportunities available to, and improve the educational programs provided for, rural youth of high school age.

Expected Outcome No. 1. A significant increase in the number of school and community members who have achieved and/or strengthened problem-solving skills, interpersonal skills of relating, and skills of inner-personal learning.

Expected Outcome No. 2. An improvement in the operational skills of the community and school groups and task forces involved in the project. These skills are those that relate to problem-solving, group process and self-renewal.

Objective No. 2

To increase the number of viable program alternatives readily available to Alberta's youth by field testing in an Alberta setting one or more innovations designed to improve educational opportunities for rural youths of high school age.

Objective No. 3

To improve the educational opportunities and improve the educational programs available to youths of high school age in the co-operating communities.

Expected Outcome No. 3. A greater variety of educational programs available to the high school students in the participating communities at the conclusion of the program than there was prior to its initiation.

Expected Outcome No. 4. Most of the innovations adopted during this project will improve the educational program (in terms of the objectives selected) for high school students in the participating communities.

Expected Outcome No. 5. The interest in, and attitude toward, the secondary education program in the participating communities will improve significantly during the life of the project.

Objective No. 4

To disseminate the results of Project 501 to interested persons and groups in Alberta and beyond.¹

By the time the above objectives had been formulated, the project also had been given the label "SEARCH," an acronym derived from the title "Selection of Educational Alternatives for Rural Change."

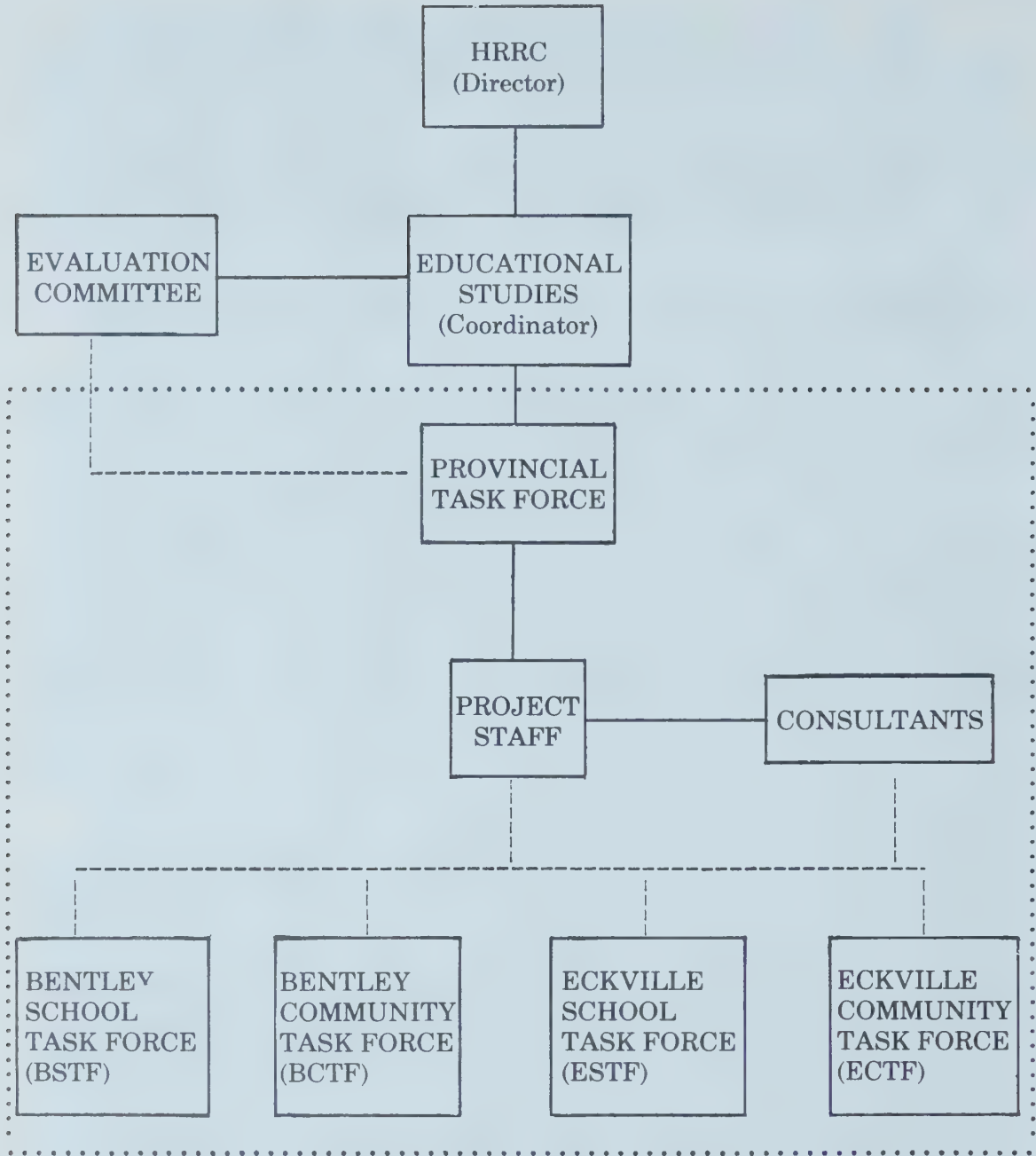
Once the objectives had been agreed to, SEARCH became a demanding operation for HRRC personnel. A site had to be selected, an operational format had to be designed, suitable personnel had to be hired; all of these actions had to be completed before the project could be considered under way. Examination of a number of possible sites eventually led to the signing of an agreement with the County of Lacombe. This agreement, approved by the County at a School Committee meeting on May 6, 1969, led to the involvement of the high schools in Bentley and Eckville — two towns located in the western section of the County and each with a population slightly in excess of 700 persons.

In September, 1969, SEARCH moved into what might be called the field phase of the project. The strategies for this phase were developed and initiated, for the most part, by a group known as the Provincial Task Force (PTF). This group was established in July, 1969, to function as an "... external 'change agent' ... to help the client system help itself" (Ingram, 1969). The PTF, after consideration of the preliminary findings of a commissioned baseline study, decided to press for the creation of separate school and community task forces in each of the participating communities. This decision proved to be one of paramount importance and was a major deviation from the original intent to establish a single school-community work group in each locale.

At about the same period of time, the formation of an Evaluation Committee was being considered for the purpose of providing evaluation services for the Educational Studies area of HRRC and its various project components. With these developments the operational relationships in SEARCH took the form shown in Figure 1.

The period from September, 1969, to January, 1971, was notable because of the number of changes which occurred. The planned Evaluation Committee never became effectively established. The Provincial Task Force (PTF) ceased its activity by mid-November, some five months after its initiation. The writer accepted increased responsibility for the project and, as of July, 1970, was named to head the endeavor. Two individuals

¹ An abridgement of the objectives and outcomes as presented in an unsigned and undated mimeographed document titled, "Project SEARCH (Project 501 — Selection of Educational Alternatives for Rural Change)."



Legend

Authority Relationship _____
Service and Support Relationship - - - - -
Project Group

Figure 1. Operational Relationships in Project SEARCH as of September, 1969.

experienced in working with small groups were brought in to serve as consultants with the field task forces. The operational base was transferred from Edmonton to Calgary to facilitate more effective liaison between the project administrator and the project head. Early in 1970 action was taken to establish an evaluation team which was to have as its primary responsibility the evaluation of the SEARCH operation. A new

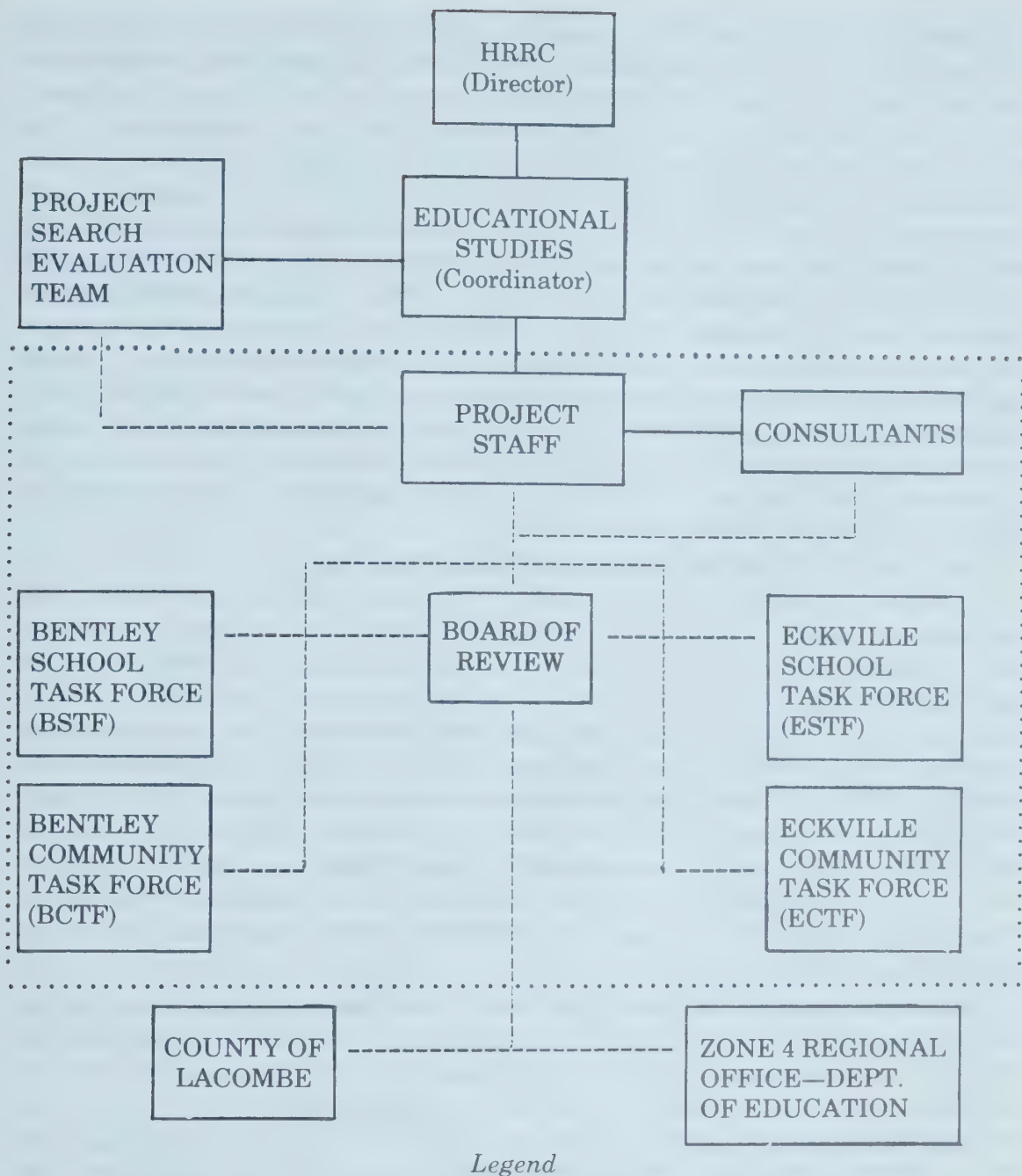


Figure 2. Operational Relationships in Project SEARCH as of June, 1971.

component, the Board of Review, was established and had as its membership representatives from each of the task forces, the project staff, the County of Lacombe School Committee (including the Superintendent of Schools), and the Zone 4 Regional Office of the Department of Education. By January, 1971, the organizational structure of the project had taken the form shown in Figure 2, a form that has remained unchanged to the present time.

Project SEARCH might be thought of as a social system containing, at the time this report was written, six discrete operational entities including the two school task forces, two community task forces, the Board of Review, and the project staff (including the two consultants). The school task forces are responsible primarily for efforts to design and implement new programs in the respective schools. The community task forces have focused their attention on ways and means of involving the total community in appropriate activities relative to the functioning of the school as an integral part of the community. While the school groups have as their prime concern the within-the-school aspects of the project and the community groups with broader community concerns, the activity boundaries of the two have overlapped to a considerable degree and, generally speaking, in a mutually supporting fashion. The task forces, it must be stressed, are the only operational entities that possess the power to initiate direct action relative to the bringing about of innovations in the schools and the communities.

The Board of Review was created after the project was well underway. When negotiations were being conducted with the County of Lacombe in April, 1970, for the extension of the project into its second year of being, it was proposed that a Board of Review be established to distribute money set aside for the support of innovative endeavors of the task forces.² In addition, and perhaps most important for the continued viability of the project, it was the intent that the Board would serve as a vehicle for improving and maintaining communication among the various task forces and between the community and county levels of operation. The Board of Review, it was reasoned, might become a means whereby the motivation and facilitation of locally initiated attempts to bring about educational improvements could be continued after the planned termination of the project in 1972.

The main function of the project staff has been and continues to be the support of the task forces in their efforts to work toward the objectives of the project. As one might expect, it is the responsibility of the staff to look after the administrative details required for the maintenance of the project and to make certain that the activities engaged in are consistent with the intent and policies of the prime initiator, the Alberta Human Resources Research Council. To date, the support given to the task forces has been largely in the form of information and advice relative to the problem-solving process, group functioning and possible educational alternatives. In its attempts to increase the effectiveness of individuals and groups alike, the project staff has designed and held local training sessions and, on occasion, sponsored the attendance of individuals to selected conferences and workshops. At most meetings of the task forces, one or two staff members are in attendance to assist in a variety of ways. Continued participation in local sessions enables the staff to monitor the progress of the groups and to anticipate accurately future

² In a document titled "AGREEMENT, dated June 15, 1970," the Alberta Human Resources Research Council and the County of Lacombe agreed to contribute sums of \$6,000 and \$2,000, respectively, to establish an Innovations Fund to support the endeavors of the four task forces.

requirements. The role of the staff is not to direct but to facilitate the endeavors of the groups in their efforts to bring about educational improvements at the local level of operation.

A Review of Task Force Endeavors

A complete and comprehensive review of all activities associated with Project SEARCH to the present time is impossible because of the limitations of space. All that can be attempted is an overview of some of the major events and areas of concern of the various task forces. Inherent in any limited presentation is the probability that the biases of the writer will be reflected to a disproportionate degree, that many significant contributions of specific individuals will be overlooked, and that information necessary for a proper appreciation of the actualities of selected events will be omitted. It is hoped that the biases of the author are not too flagrant, the information presented sufficient for reader understanding, and the failure to recognize significant contributions understood by the participants.

The definitive undertaking of the task forces can be categorized into (1) those supported by the Board of Review's Innovation Fund or (2) those conducted without any support from the Fund. Undertakings conducted without support from the Fund can be financed from trust funds made available for and under the control of each of the task forces. Each school task force is provided an amount of one thousand dollars to meet expenses incurred during the course of any one year. An amount of five hundred dollars is provided for each community group for the same purpose. These task force funds are provided solely by HRRC.

If any task force requires money for a specific undertaking and deems it necessary and/or desirable to approach the Board of Review for support, the group is required to present for the consideration of the Board a submission which provides information related to the following topical outline:

- a. General Statement of Intent
- b. Statement of Need
- c. Outline of Specific Objectives
- d. Outline of Project Specifications
 - i. Duration of the proposed project
 - ii. Space and facilities requirements
 - iii. Material resources requirements other than space and facilities
 - iv. Human resource (paid and volunteer) requirements
 - v. Financial resource requirements
- e. Outline of Resource Sources
- f. Outline of Possible Constraints
- g. Statement of Strategies for Overcoming Possible Constraints
- h. Project Management Plan
- i. Project Communication Plan
- j. Statement of Support Required from Board of Review
 - i. Essential support requested
 - ii. Desired but not essential support requested (Project SEARCH Board of Review, 1970).

Any proposal submitted to the Board of Review is appraised and a decision made regarding the degree of support it is to be given. In arriving at its decision, the Board concerns itself with factors such as the relevance of the planned undertaking to established needs and the objectives of SEARCH, the legality and legitimacy of the proposed actions, the probable long and short range impact of the endeavor on other activities and programs, the practicability of the proposal, and the possible pay-off relative to the investment of resources required. Following due consideration of the submission, the Board must take one of the following courses of action:

- a. Approve, without modification, the proposed project and allocate a sum of money from the Innovations Fund for the support of the project.
- b. Approve the proposed project with the provision that certain stipulated modifications must be made and allocate a sum of money from the Innovations Fund for the support of the project as modified.
- c. Approve the proposed project (with or without the stipulation that it be modified), allocate a sum of money from the Innovations Fund for the support of the project, and recommend to the sponsoring group or groups that the proposal be submitted to other agencies for support.
- d. Return the proposal to the sponsoring group with a recommendation that it be resubmitted to the Board of Review after certain specified alterations are made.
- e. Reject the proposal and return it to the sponsoring group with a clear indication of the reasons for rejection of the proposal.
- f. Reject the proposal and return it to the sponsoring group with the recommendation that it be submitted to some other agency (to be named) for support and funding. (Project SEARCH Board of Review, 1970).

As of September 15, 1971, the Board of Review had received and considered five separate requests for support; all five were funded to the extent that the proposed activities could be undertaken by the sponsoring task forces.

Bentley Community Task Force Endeavors

The primary concern of the Bentley Community Task Force (BCTF) has been to develop an effective group operation and, as a result, has focused mainly on the interaction process as it relates to the performance of group members in problem-solving situations and to the functioning of the school in its community environment.

Early in 1970 the BCTF undertook an ambitious survey of the thinking of the community with regards to educational needs and concerns. The first step was to hold a workshop for members of the task force on needs analysis and problem-solving. This preparatory activity was followed by the development and administering of a "Survey of Opinions on Education." The data from the survey of community thinking were compiled and analyzed by the group. Information from a study commissioned by HRRC (MacKay, 1970) was used to supplement and verify the findings and became the focal point of considerable discussion. By the end of the year the membership of the task force³ was in agreement that a major

³ By this point in time four members of the teaching staff of the Bentley High School were active members of the BCTF.

effort should be made to find ways and means of improving the relationships between the school and community — an area of prime concern revealed by the survey.

As a result of its initial activities, the BCTF was in a reasonably good position to accept from the County School Committee an invitation to prepare a report pertaining to the objectives of the school in Bentley. Following a series of small group interviews conducted by its members and involving about one hundred adults and fifty students, the task force presented to the County School Committee meeting of May 10, 1971, an "Interim Report . . . Regarding the Objectives for Bentley School Community" (Bentley Community Task Force, May 10, 1971).

While dealing with the problem of defining objectives, the group became involved in considerations related to the desirability of upgrading the school plant and its physical facilities. The end result of these considerations was the submission of another report to the County School Committee. This report dealt with ". . . the area of building and site changes from a *Community* point of view," and suggested to the school trustees that ". . . any renovations and/or additions you choose to make to the school be planned in such a fashion that the facilities be accessible to the community as much as possible and, therefore, eliminate needless duplication of facilities in the community" (Bentley Community Task Force, June 7, 1971). To what extent the dialogue between the task force and the school committee prompted subsequent developments is difficult to ascertain; however, during the summer vacation period considerable renovations and improvements were made to the Bentley High School building.

Bentley School Task Force Endeavors

A definitive and stable role for the Bentley School Task Force (BSTF) evolved slowly and not without considerable frustration on the part of all concerned. Though the group began its deliberations early in the 1969-70 school year, it was not until the summer months one year later that any degree of consensus began to emerge as to the functions to be performed by the group. The arduous task of finding time for needed dialogue, a variety of conflicting expectations, and the lack of clearly stated guidelines for the total project and its component parts appeared to be some of the major reasons for the difficulties encountered. In spite of many problems, an agreement was reached that the task force would serve primarily as an advisory group for those individual teachers wishing to experiment with new instructional modes and techniques.

During the period of time taken by the group to establish a concept of its own role and operational format, two significant developments occurred. One such development was the involvement of the principal and some members of the task force in the activities of the community group. This involvement increased substantially the opportunity for effective cooperation between the school and the community. The second development, judged by the writer to be of considerable significance, was one which led to the first request to the Board of Review for the funding of an innovative project. On the initiative of the SEARCH staff, the

principal of the Bentley High School was given an opportunity to visit a number of schools involved in the Western States Small Schools Project. His observations of the activities in these American schools, as reported to the task force members, prompted the home economics teacher to investigate further a program for individualizing instruction in her subject area. As a result of this inquiry, a proposal was developed and submitted by the BSTF to the Board of Review for necessary funding. At its meeting on August 28, 1970, the Board allocated the requested amount of money (\$1,005.50) to support the implementation of an instructional program known as "Individualized Home Economics" (Bentley School Task Force, 1970). This particular program was launched and subjected to considerable scrutiny during the 1970-71 school year. In a commissioned evaluation of this project the following comment was made:

The pilot study involving Individualized Home Economics Instruction at Bentley High School can be viewed as a success in reference to student enthusiasm and interest in the new program. Individualized instruction as a teaching method is an improvement over the traditional teaching method practiced at Bentley in the past (Hakstian, Muller and Hugstad, 1971, p.47).

The materials and procedures used in this program have been refined and will be further tested during the current school year.

A second request was made by the task force to the Board of Review on April 30, 1971. This request for the support of "... an Experimental Project in Film Making in High School English" (Bentley School Task Force, 1971), resulted in the Board assigning the sum of \$500.00 to the endeavor. At the time of writing, there has been no formal report regarding the success of this venture.

Eckville Community Task Force Endeavors

Two features tend to distinguish the Eckville Community Task Force (ECTF) from its Bentley counterpart. One such feature is the nature of its membership. From the time of its first meetings, the Eckville group has attempted to achieve active student involvement in its endeavors. Students have not been participating members of the Bentley community group in its period of operation to date. Another difference in the membership characteristics of the two groups relates to continuity of involvement. Since the establishment of the two groups late in 1969, the membership of the BCTF has been relatively stable in terms of the numbers actively participating in meetings of the group; this number tends to be about twelve for most sessions. The membership of the BCTF also has been rather stable in terms of continuity of participation. For the most part, the same individuals have been active in the group throughout its span of life.

The situation with the Eckville group has been very different. The size of the Eckville CTF has fluctuated greatly, with attendance figures ranging from less than five to more than thirty. With the exception of a core of about five individuals, the pattern has been for individuals to participate for periods of short duration.

A second feature tending to make the two community groups different relates to the areas of prime concern. The BCTF deliberately has

focused much of its efforts on the development of group performance skills. On the other hand, the ECTF has focused its attention and efforts on selected and specific tasks. The BCTF has been essentially process-oriented while the ECTF has been product-oriented.

In its early deliberations the Eckville group identified as urgent the need for a locally based driver training program. Though often discussed, little direct action was taken to satisfy the expressed need until October, 1970. One reason for the delay in dealing with the need for driver training was the group's decision to conduct a survey of community concerns about the educational program and related matters. The survey paralleled in time and scope a similar undertaking by the community task force in Bentley. Following the completion of its survey during the summer, the task force decided to direct its energy to making available a program of driver training for Eckville students. Acting with a sense of purpose and considerable dispatch, the group developed a case for and designed the details of such a program. The resulting brief requested financial support from the Board of Review's Innovation Fund. This support was granted on November 27, 1970, and an Alberta Motor Association program was implemented during the second semester of the school year. The Board of Review subsequently received a report that "of the thirty students who started the course all . . . completed it and received their A.M.A. certificate card."⁴ Whether or not such a program will be offered in the community during the current school year has not yet been decided.

A second major product of ECTF deliberations has been the formation of a body known as the Eckville Community-School Advisory Board. Acting largely on the initiative of the community group, the two Eckville task forces moved to establish an Advisory Board to "provide communication links between the community, the County Board, and the school" and to make "recommendations to appropriate individuals or groups for various aspects of the operation of the Eckville schools when asked or when a need is felt" (Eckville Community Task Force, 1971, p. 7). Awareness of the need for such a body came about because of information resulting from the community survey, HRRC's commissioned baseline study of the community and the school (MacKay, 1970), and the numerous meetings of the ECTF. The three students, two teachers, three parents, and one school trustee that constitute the membership of this new body anticipate that the first meeting will take place early in the fall of 1971.

Eckville School Task Force Endeavors

Though faced with the same basic difficulties that frustrated the Bentley school group, the Eckville School Task Force (ESTF) was able to launch a specific project much earlier than was the case in Bentley. On September 24, 1969, four members of the Eckville staff volunteered to serve on a committee created to explore some possibilities for establishing a school planning group. One week later the school staff and SEARCH personnel ". . . were confronted with a problem which was in urgent need of resolution if the Project were to be implemented in the school.

⁴ Report presented to the Board of Review meeting, April 30, 1971, titled "Summary of Driver Education at Eckville."

The problem was that of the teaching staff being able to obtain time for participation" (West, 1970, p. 7). So it was that even before the Eckville School Task Force became established, a concern which was to stimulate the launching of the first major task force activity in the SEARCH program had come to the surface. This major activity, designed to assess a strategy for freeing the time of teachers so that participation in SEARCH endeavors would be possible, became known as the Eckville Teachers' Aide Project and was effectively launched by February 1, 1970. Its period of operation covered the next six months.

In December, 1969, it was agreed that the task force would be a permanent operational group in the high school of Eckville. Though a substantial number of meetings were held during the balance of that school year, there was little accomplished that was of a definitive nature except for the Teachers' Aide Project. As was the case for the Bentley School Task Force, the major obstacles faced by the group were lack of adequate time, conflicting expectations, and the nonexistence of precise operational guidelines. In addition, when the school began its operations for the 1970-71 school year, it was necessary to start almost from the beginning because all staff members who had been most actively engaged in the deliberations of the group had either terminated their affiliation with the school or had ceased to be full-time members of the teaching staff.

During its second year of existence the Eckville STF was able to launch a two-part project. In November, 1970, the Board of Review, reacting to a proposal presented by the ESTF, made available financial assistance for the initiation of a program of planned change. The presentation to the members of the Board of Review stated that the program was to be concerned with:

1. The development of an individualized science program for the junior high school students (grades 7 through 9) which would be implemented in the 1971-72 school year.
2. The initiation and execution of a program of activities (undertaken in cooperation with the Eckville Community Task Force) designed to:
 - a. Undertake an appraisal of "people" needs in the Eckville School and Community.
 - b. Determine the resources available for the possible satisfaction of some of the identified "people" needs.
 - c. Develop plans for bringing about the effective and efficient utilization of the available resources in providing for the satisfaction of some of the more important and urgent school and community needs (Eckville School Task Force, 1970, p. 1).

It was pointed out in the presentation that most of the requested financial assistance would be used to employ additional staff so that the four teachers concerned could be freed from a portion of their regular teaching responsibilities. Though the work done on the two parts of the undertaking was substantial, considerable frustration was encountered because of difficulty in obtaining suitable relief staff. The extent of real progress in the attainment of the objectives of this project will be established during the coming months.

Some Observations and Suggestions About Development Projects

At this point in the life of Project SEARCH the writer is unable to present any definitive conclusions or to make any specific recommendations resulting solely from his experience with and the data already obtained from this particular project. All that can be done is to make some general observations and suggestions based on his involvement in SEARCH and other similar undertakings. The observations and suggestions that are presented in the following section have been restricted to comments about the design and implementation of field-based and field-involved development undertakings at the school or community level of operation.

Developing the Design

The creation of a design for any development endeavor is without question the most critical single major event in any project. It is the foundation on which all subsequent activity is based. The design must be comprehensive, that is, it must take into account all conceivable dimensions of the project. It must be compatible with other planned activities and events with which it must coexist in the school or system. It must be detailed to a degree that might appear to many to be absurd and a wasteful use of the resources of the design team. Above all and in spite of its complexity, the design must be capable of being understood by everyone who will relate to it in the future whether they be trustees, teachers, central office personnel, consultants or evaluators.

The design should be based on a thorough and accurate assessment of the current state of affairs; a clear statement of the short, intermediate, and long range objectives of the agencies involved; and a precise definition of the nature of the problem which is to be the focal point of the endeavor. In short, the project design must be based on accurate information as to "what is" and "what is to be."

Once the design team has the necessary antecedent information, attention can be given to the creation of the design itself. However, any design that is generated in the early stages of the planning process should be considered as tentative. It is suggested, resources permitting, that efforts be made to sketch out a number of design possibilities before any enduring commitment is made by the planners. One format for the design of development projects that has been successful in a variety of situations is that which was presented in the preceding section as a guideline for those in SEARCH who make submissions for support to the Board of Review.

There are many aspects of the design operation that require further elaboration but limitations of space restricts such discussion; however, there are four points that can be stressed. First, the development of an adequate project design is a demanding and time consuming task that requires a substantial investment of resources. Such an investment must be made and must be considered to be of a high risk nature. Second, any design must be both flexible and adaptable. It should be capable of being expanded or reduced in scope depending on future conditions. Allowances must be made to exploit new opportunities that arise or to deal adequately with unanticipated difficulties. Major decision points must be noted and

provision made to cope with a wide range of possibilities, some of which are bound to be unknowns at the time the design is being developed. Third, the objectives of the project must be stated in terms that are operationally meaningful. If the statements that are to serve as guidelines for all subsequent activities are obscure, one can say with a fair degree of confidence that the individuals involved will be unduly frustrated, activities will be confused, and scarce resources will be wasted. The fourth and final point to be emphasized is the need to make certain that those individuals who are to assume primary responsibility for the implementation and maintenance of the project are meaningfully involved in all stages of the design phase. In other words, accountability for the achievements of the project cannot be properly assigned to, or assumed by, any one individual or group of individuals unless they have been key figures in the design phase of the operation.

Implementation of the Design

Only after the design has been developed and subjected to severe scrutiny can the implementation phase begin. Implementation must start with those people who are to be involved in the project being given a comprehensive picture of intended activities and events. They must be given an opportunity to develop any new skills required by them in the performance of their assigned and precisely defined roles. Care must be taken to make known to all participants the extent of the investment expected of each individual. All must be aware of any potential risk and pay-off possibilities that exists for agencies and individuals concerned. Coercion, half-truths, and hidden agendas have no place in development projects. Experience has shown that in any community there are many teachers, parents, and students who are prepared to make major investments of time and energy, who are willing to take risks for minimal or no personal gain, and who are ready to accept frustrations and disappointment in the hope that they can contribute to bringing about educational improvements. However, these same individuals are apt to be reluctant and unproductive participants if they do not consider the intent of the project to be important, if they are confronted with a plan that is obscure, if they perceive risks and pay-off to be unfairly distributed, or if they assess the expectations held for them to be unreasonable.

Conclusion

To what extent Project SEARCH will be successful in achieving the objectives set out for it is open to speculation at the present time. There is no doubt, however, that those who have been involved in the endeavor will have learned a great deal about the essential requirements for similar undertakings in the future. Therefore, regardless of the eventual outcome, the challenge in the future for the project staff will be to consolidate what has been learned and to make such information available to others desirous of attempting to bring about significant improvements in their particular school, system, or community.

In light of past experiences, the promise of the future appears to depend on the extent to which the prime decision-makers in the field of

education are prepared to accept the contention that "to try and fail is at least to learn; to fail to try is to suffer the inestimable loss of what might have been" (Barnard, 1938, dedication page). This is what SEARCH is all about.

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Evaluation Research with Illustrations From Project SEARCH¹

Evaluation research is defined and the increasing demand for such research is noted. A simple model for service and development programs is presented to illustrate the function of evaluation research within a dynamic system. The implications of this model and the problems confronting personnel responsible for the evaluation function of a complex or multi-goal project are discussed with reference to Project SEARCH. Some concluding comments are made regarding the professional development of evaluation researchers.

The Meaning of Evaluation Research

Project SEARCH illustrates a venture in development and social change. It is a goal-oriented activity and therefore qualifies as an object for evaluation research.

The *scientific* study of such ventures which assesses the degree to which they achieve their objectives and which explains the reasons for their success or failure constitutes evaluation research. Suchman (1967) defines evaluative research as "the utilization of scientific methods and techniques for the purpose of making an evaluation" (p. 7). He thus distinguishes between evaluation as a general construct and evaluation research as a specific type of evaluation. The purpose of evaluation is to judge the worth, value, or impact of some goal-directed activity. Evaluation research is that particular mode of evaluation which strives to employ the techniques of scientific research in order to minimize the degree of subjectivity entering into the assessment.

From the outset, we would like to proclaim our concurrence with Suchman's point of view. We, too, regard evaluation research essentially as research, and we believe that it should adhere as closely as feasible to the canons of scientific methodology.

¹ The writer wishes to acknowledge his indebtedness to Mr. William Lang and to Dr. W. Zwirner who read the original manuscript and who provided several helpful suggestions for revision.

Growing Demand for Evaluation Research

Increasing awareness of the need for evaluation as a technical service to development programs (eg. Project SEARCH) and to service programs (eg. health, education, and welfare programs) is likely to result in the rapid development of evaluation research as an area of professional specialization. The acceleration of social change, the expansion of knowledge, the emergence of participatory democracy, and the demand for accountability are contemporary phenomena which encourage and support the growing demand for evaluation research.

In the concluding chapter of *Future Shock*, Alvin Toffler (1970) argues that we are now at that supreme instant in history when man shall become either master or victim of the processes of change. Assuming that man diligently strives to become master rather than victim, his efforts to capture control of and to provide direction to social change are likely to succeed only through programmatic action. Such action must be both *planned* and rigorously *evaluated*.

The explosive development of knowledge makes contemporary wisdom appear antiquated, thus creating a demand for a variety of innovations within our social institutions. Business corporations, eager to capture new markets, are likely to develop and promote a wide variety of new procedures and products. It is fairly safe, therefore, to predict that evaluation research increasingly will be called upon to determine the degree to which new ideas, new knowledge, new technology, and new products can be put to practical use. Most studies regarding the application of computers in education, for example, may be construed as evaluation research. Moreover, these studies frequently illustrate the effective use of scientific methodology to evaluate the potential application of new technology within a specific context (eg. Hallworth et al., 1971).

By incorporating more and more people in the social decision-making process, the trend toward participatory democracy has created a need for a technology capable of providing to the populace "credible information" concerning the probable consequences of alternate courses of action. As Lortie (1967) notes, "the necessity to make choices forces people to attend to the grounds for choice" (p. 3). Evaluation research, through rigorous collection and objective analysis of data regarding the relative costs and benefits of various trade-offs is admirably suited to provide the basis for rational choice in the realm of social policy.

The ever-growing spectrum of social alternatives coupled with the recognition that our resources are not infinite has created a demand for accountability. Social service programs will require "proof" of their effectiveness relative to their costs if they are to enjoy society's continued support. That proof is likely to take the form of an "independent audit" or external evaluation.

A Basic Model for Service and Development Programs

According to the editors of *Education U.S.A.* (1971), "accountability" has a very specific meaning for service and development programs. This meaning is conveyed by the following formula: "Decide what it is you're

going to do. Do it. Then prove that you're done it" (p. 9). Three somewhat discrete functions are implied: setting goals, operating upon the environment to achieve those goals, and *evaluating* the degree to which they are achieved. Although amazingly concise, this definition of accountability also contains the three basic functions in a more general model for service and development projects.

Figure 1 presents a skeletal outline of such a model. By providing only a single level of detail, systems builders are left with freedom of "designer's choice" to elaborate higher levels of detail. The total system envisioned by Figure 1, however, is characterized as open, dynamic, and multicausal.

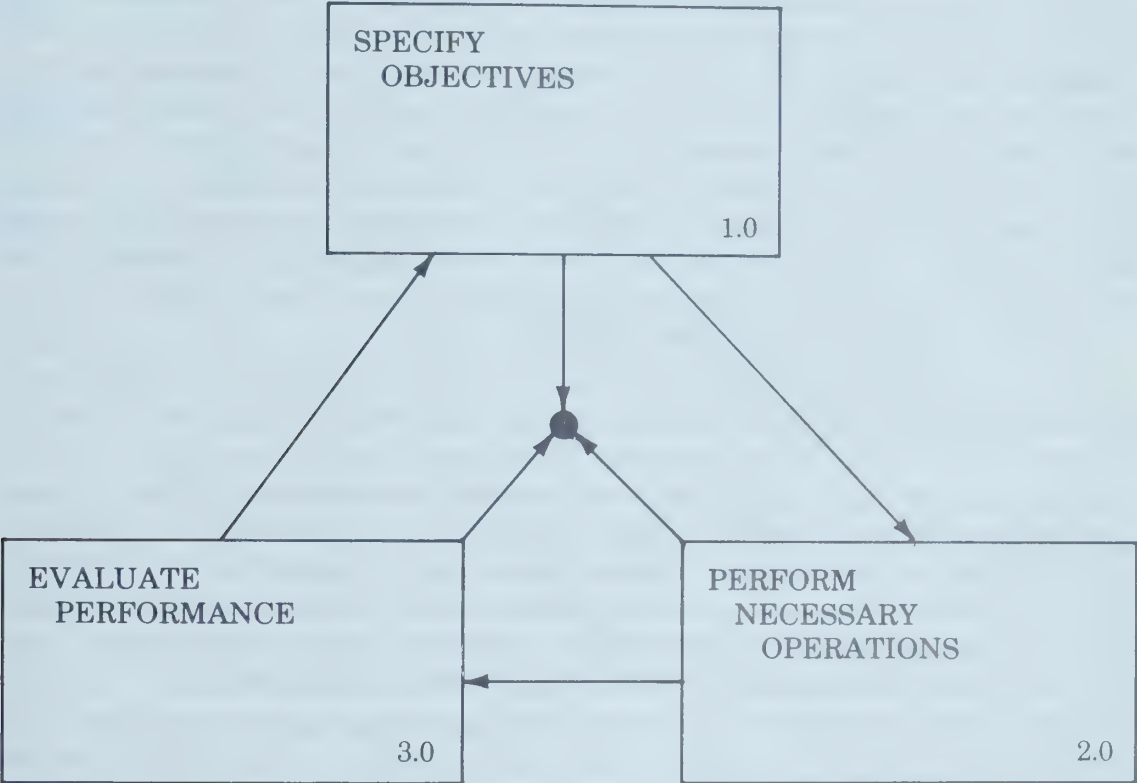


Figure 1. A Basic Model for Service and Development Programs.

Signal paths leading from "Specify Objectives" to "Perform Necessary Operations," and from "Perform Necessary Operations" to "Evaluate Performance" indicate the sequential dependence of the latter functions upon the existence of the former. One cannot perform a coherent series of operations intentionally designed to achieve a set of goals until those goals have been specified. Moreover, one cannot evaluate the procedures or operations intended to achieve specified goals until those operations have at least conceptual existence. Efforts to evaluate without first specifying both objectives (the dependent variables) and the operations calculated to produce these objectives (the independent variables) according to Suchman (1967), is like undertaking basic research without formulating an hypothesis.

The relations among the basic functional components of the model are not limited, however, to the linear or sequential aspect. Each com-

ponent in the system influences and is influenced by every other component. The results of evaluation, for example, may elicit a reformulation of objectives or a modification in operational design. Modifications in these components, in turn, will require alterations in planned procedures for evaluation. The unspecified complex network of feed forward and feedback loops which characterize the dynamic relationships among the basic components of the model is graphically represented in a manner suggested by Silvern (1969) by signal paths converging to a central dot.

Implications of the Model for Evaluation Research

Our experience with Project SEARCH illustrates the importance of attending to the dynamic relations among the basic functional components of the Project. The initial specifications of project goals, as presented by Ingram (1969) in a rationale for the project, was developed before the Project Head assumed responsibility for "operations" and before the writer was appointed as "Evaluator." The design for both "operation" and "evaluation" functions, moreover, were drafted in relative isolation from one another. This failure to establish workable relations of dynamic influence among the basic functional components of the project constitutes a serious weakness.

Those responsible for the evaluation of Project SEARCH were not involved in setting out its objectives and thus were unable to influence the specification of those objectives in terms of outcomes which are observable or amenable to criterion-referenced measurement. The failure of both operations and evaluations personnel to participate in the specification of objectives, moreover, creates some doubt regarding the validity of their interpretation. Of considerable concern is the possibility that operations personnel may devote their efforts to the achievement of one set of outcomes while evaluations personnel assess quite another.

Appropriate involvement at the planning stage and continuous coordination of all three functional units throughout the life of a development project such as SEARCH would do much to increase its effectiveness. This suggestion, perhaps, requires some clarification. We are not arguing that "he who pays the piper *must* allow the piper to call his own tune." There are no logical reasons why one may not enter into a performance contract to produce outcomes, the formulation and evaluation of which are beyond his purview. Such a contractor, if prudent, however, will insist upon unequivocal and perhaps written specifications of the outcomes that he has agreed to achieve and the criteria for their evaluation.

Projects vary in the degree to which their objectives are amenable to unequivocal specification, especially at the initial stages of project development. For example, projects to increase profits, to reduce the incidence of dental caries, or to improve reading comprehension are rather straight forward. The goals for such projects are clear and their evaluation is a relatively simple task. When this situation obtains, the dynamic relations among goal specifications, operational procedure, and evaluation are of lesser significance.

A statement of the ultimate purpose of Project SEARCH illustrates the problems which arise from the goal ambiguity inherent in complex social innovation projects and also illustrates the importance of early and continuous dynamic interaction among those who design projects, those who carry them out, and those who evaluate them.

Assessing Educational Opportunity

As presented in the project's rationale (Ingram, 1969) the major aim of Project SEARCH is "to develop ways and means of increasing educational opportunities and improving educational programs for rural youth of high school age" (p. 8).

Interviews with a sample of residents from both project communities indicate almost unanimous support for this broad goal. Nevertheless, when an attempt is made to specify the meaning of *educational opportunity* in order to provide for its measurement, we discover that a wide variety of meanings attach to the concept. The population of a pluralistic society holds diverse values.

As an evaluator, whose meanings and whose values do you choose? Attending to this methodological question, Ingram and West (1971) elsewhere, have suggested the development of a phenomenological solution. In short, the measurement of educational opportunity would become "idio-criterion-referenced" (ie., each subject in the assessment sample would be free to specify those criteria which *for him* constitute an educational opportunity). Opportunity, from this point of view, may be regarded as an individual matter. It is important to note that such assessment makes no reference to the definitions of experts or the norms of society. In other words, a case may be made that both criterion-referenced measurement in which the criteria are determined by professionals, and norm-referenced measurement are inappropriate and therefore invalid for our particular purpose.

Although idio-criterion-referenced measurement which we suggest for the assessment of educational opportunity is an extension of the concept of criterion-referenced measurement, the assumptions underlying such measurement are consistent with the later construct. Since publication of Robert Glaser's (1963) classical paper which distinguishes between norm- and criterion-referenced measurement, there has been increasing appreciation for the superior validity of the later to assess the achievement of educational objectives (Popham, 1971).

The proposed technology for the assessment of educational opportunity remains undeveloped at present, and will not be available for use in the valuation of Project SEARCH.

It is of particular importance to note at this point in our discussion that the post-planning, on-site experience of grappling with the problems of specifying, defining, and measuring such concepts as "educational opportunity" and "improved educational programs" has led to significant learning outcomes. Such problems could not have been anticipated during the initial stages of project planning.

Indeed, if we are to gain valuable insights about complex social service or development projects we cannot forever remain at the stage of arm-chair preplanning. We must launch out with a tentative agenda for action. A system of formative evaluation with its continuous feedback to the "goal specification" and "operations" components of the project will assure those revisions and modifications necessary to improve an imperfectly conceived design.

In short, despite our general emphasis upon the dynamic relationships among the basic components of broad-goal projects and the importance of establishing these relations early within the planning stages of the project, we do not argue that Project SEARCH, in particular, was hastily conceived or prematurely given birth. Rather, we would suggest that given the current stage of Research and Development experience in Alberta, Project SEARCH offered a truly unique opportunity to "learn by doing" not only for those engaged in project development and administration but also for those engaged in project evaluation. Moreover, the dissemination of our experience, hopefully will prove instructive to an even wider audience. In this regard, the project has served admirably one aspect of HRRC's mandate:

to encourage and facilitate the training of persons engaged in educational, social, economic, and other related research. (The Human Resources Research Council Act, 1967)

Confronting a Failure of Nerve

Perhaps the easiest of all research assignments is to develop the ideal evaluation design. Yet the most difficult assignment, no doubt, is to carry out such a design in practice. The history of Project SEARCH indicates that suggestions for and criticisms of proposed evaluation plans were readily available from a variety of both professionally recognized and self-styled experts. By way of contrast, the number of researchers who expressed a willingness to contract responsibility for conducting even a small portion of the evaluation has been disappointing. Moreover, the attrition rate for those who have been involved in the evaluation of the project has been high, indeed. It is easy to set standards and draft plans that you do not have to live by, but the task of getting on with the "nitty-gritty" execution of those plans in a real-life setting is messy business.

Socialized in the norms of pure research, our initial plans for evaluation tended to be elegant, academic, ambitious, but impractical. We wanted to do too much of the wrong thing. We discovered to our dismay that the evaluator, unlike the pure researcher, has little control over the situation. He must often remain unobtrusive, silent, and apparently inactive. Although he is obliged to evaluate he must not interfere with the smooth flow of operations' activities. The Project Head of SEARCH, for example, legitimately requested that

. . . the operation group must be in a position to request and, if necessary, direct changes in evaluation activities and procedures which might be seen as threats or hinderances to the viability of field activities (Roberts, 1970).

We soon realized that reality imposed constraints which had to be faced if ever we were to get on with the job. In short, we had to confront a "failure of nerve." Although that term most commonly occurs in philosophical discourse, Skinner (1971) suggests that:

The expression is an indirect way of talking about our failure to take effective action . . . (p. 35).

The stakes were high. Few scholars are prepared to gamble with whatever academic prestige and influence they have devoted a lifetime to develop. Fortunately, a penchant for situational ethics and a willingness to deviate from absolute norms, when necessary, provided the courage to make those trade-offs required for survival as evaluators. In the place of carefully *controlled* conditions, so essential to pure research, we often had to settle for carefully *observed* conditions (eg., monitored video-tape recordings of all task force meetings). When expedient, we sacrificed the criterion of statistical significance for that of practical relevance (cf. Guba, 1969). In the place of experimental verification we had to resort to a variety of reasonably veridical sources of converging evidence (eg., data gathered from interviews, questionnaires, etc.).

The foregoing comments must not be construed to indicate abandonment of our original declaration of faith in the ability of scientific method to provide useful direction to the process of evaluation research. We simply have come to appreciate that the degree to which the canons of scientific rigor are met, even in basic research, is a relative matter. To compromise with the ideal may be unfortunate, but it is hardly catastrophic.

Albert Ellis (1971), commenting on psychological health and well being states that emotional disturbance is always the product of *demanding* rather than *desiring*. Analogously, we would suggest that the failure of nerve which prevents many outstanding scientists from making valuable contributions to the methods and practice of evaluation research arises from an over-socialization in the norms of scientific purity.

Science is an attitude as well as a method; moreover, it is a means rather than an end. As a useful tool for the social sciences, it must serve rather than control man's search for knowledge and understanding. Guba (1969) effectively illustrates this principle:

Perhaps the most damaging assertion that may be made about the application of conventional experimental design to evaluation situations is that such application conflicts with the principle that evaluation should facilitate the continuous improvement of a program. Experimental design prevents rather than promotes changes in the treatments because . . . treatments cannot be altered if the data about differences between treatments are to be unequivocal. Thus the treatment must accommodate the evaluation design rather than vice versa (p. 34).

As science is not an all-or-none phenomenon, the project evaluator will do well to avoid the either/or fallacy with respect to scientific methodology. A lack of scientific purity does not imply promiscuity. Although we must continuously strive for greater scientific rigor in our evaluation designs, we must refrain from demanding adherence to nothing short of the ideal design and we must stop grumbling (or, in the language

of Ellis, *awfulizing*) about the compromises which reality imposes. To the evaluator of service and development programs, especially those which are characterized by multiple or broad goals, demanding is dysfunctional and awfulizing is debilitating.

What Do We Evaluate?

Having confronted a failure of nerve and having acknowledged that we must take immediate and effective action to provide some form of evaluation for Project SEARCH, we then were confronted with a new decision problem: What do we evaluate?

Obviously, not all facets of a complex endeavour can be carefully observed, documented, measured, or subjected to detailed analysis. Evaluation always entails some selection of what is and what is not to be evaluated. Moreover, that decision introduces an element of subjectivity into the evaluation process. Fortunately, various evaluation taxonomies based upon a wealth of evaluation experience have been developed which provide some guidance regarding the selection of those aspects of a project most worthy of the evaluator's attention.

Stake (1967) makes a distinction between the *theory of evaluation* which deals with the problems of what is to be observed and judged and the *methodology of evaluation* which specifies how such observations and judgements are to be made. With this distinction in mind, we now shall turn briefly to the theory of evaluation as it relates to Project SEARCH.

One popular method of classifying evaluation activities has been provided by Stufflebeam (1968). Briefly, the CIPP model identifies four classes of project decisions; hence, four corresponding types of evaluations — context, input, process, and product.

Context evaluation occurs in the initial stages of project planning. Its essential purpose is to describe the environment in which the change or service is to occur. This type of evaluation provides background information for specification of the more immediate project goals. The context evaluations for Project SEARCH are reported in a series of "baseline studies" conducted by MacKay (1970).

Input evaluation, with reference to SEARCH, has two major purposes. First, it must identify and assess those resources and capabilities of the Human Resources Research Council and of Project SEARCH personnel to achieve stated project goals. Secondly, it must assess alternative strategies or methods of achieving these goals in terms of potential costs and benefits. The end product of input evaluation is a project or operational design. In a dynamic system, an operational design, however, must not be rigid or inflexible. As previously noted, initial operational designs were drafted in relative isolation from the evaluation unit.

It is obvious from the foregoing discussions that the evaluation unit of Project SEARCH was not given a mandate to conduct either context evaluations or input evaluations. Rather, it has been the implicit understanding of all concerned that the evaluation unit would limit its sphere of activity to *process* and *product* evaluations.

Process and product evaluations are essentially equivalent to the *formative* and *summative* evaluations described by Stake (1967). The major purpose of process or formative evaluations is to monitor operational activities and to provide periodic feedback to the personnel charged with operations in order to permit a continuous refinement of plans and procedures.

Product or summative evaluations are those evaluations which are carried out at the conclusion of a project. Since they have no potential for influencing project operations, their major function is to provide a terminal assessment of the relative merits of various procedures and the worth of the project as a whole.

Suchman (1967) makes a further distinction between evaluations of *effort* and evaluations of *performance*. It will be recalled that the basic model presented in Figure 1 made reference to the evaluation of performance.

The evaluation of effort is concerned with the amount of resources expended in the pursuit of project goals. Effort evaluation assumes that all action taken on behalf of the project is an effective or valid means for goal accomplishment. Obviously, this assumption is often untenable. Our best efforts sometimes lead to negligible results and an "A" for effort is hardly consolation.

Effort evaluation is relatively easy to conduct. In the case of Project SEARCH, for example, simple administrative records might indicate such things as total economic expenditure for SEARCH operations, the number of field trips made by HRRC personnel, the number and duration of task force meetings, the size and regularity of attendance, the number of suggestions made by each task force member during a meeting, the number of educational innovations initiated, and the like. Although such data provide no certain indication that progress is being made toward the achievement of project goals, it is nonetheless relevant as an indication of what may and what may not be held potentially accountable for the success or failure of the project.

Performance evaluation is concerned with the results or the outcomes of effort rather than with the effort *per se*. It is performance evaluation which requires that project goals be specified clearly and unequivocally in terms of outcomes amenable to behavioral description and criterion-referenced measurement.

Suchman (1967) suggests that we continue beyond mere performance evaluation to the evaluation of *performance adequacy*. This criterion of evaluation is nicely illustrated with reference to Project SEARCH. A secondary goal of Project SEARCH and one which may be construed as the principal means for achieving the overall purpose of the project is to develop within the project communities a "self-renewing system" of community involvement and participation. At minimum, such a system implies a substantial number of citizens who possess both the motivation and skill (communication and problem solving skills, in particular) to cope with social change and to achieve consensus in designing the future for their community with a minimum of external intervention. For the

purpose of illustration, assume that all task force members of Project SEARCH (representing fewer than 1 per cent of the communities' total population) were to develop to an optimum level the motivation and skills previously alluded to; would this outstanding performance, by so few, be *adequate* to the task of assuring the existence of a self-renewing system within the communities at large? Such are the questions we must face if we dare to evaluate performance adequacy.

A final aspect of performance evaluation concerns *efficiency*. The currently popular term which, in reference to project operations, is conceptually equivalent to efficiency is "cost-effectiveness." Two or more operations, in theory, may be equally effective for achieving a specified goal, but one may be more efficient, ie., capable of achieving that goal with less expenditure of available resources.

Numerous questions may be asked regarding the cost-benefits of various SEARCH operations. For example, given the immediate goal of creating a self-renewing system, is it more cost-effective to concentrate upon the development of communication skills, problem solving skills, educational innovations, formal organizational structures, some other alternative, or an optimal mix of several of these "independent variables?" Secondly, given the goal of providing increased educational opportunity which is more cost-effective: (a) soliciting the participation of the consumer in program planning or, alternatively, (b) establishing programs arbitrarily based upon expert advice? With regard to the latter question, we wholeheartedly concur with Gephart (1971) when he suggests that the analysis of costs² and benefits will differ depending upon the level of decision-making to be served. Since a basic value assumption underlying Project SEARCH is that community involvement in the educational decision-making process is desirable, it follows that the costs and benefits of various policy alternatives must be assessed from the individual and community perspective as well as, if not instead of, the perspective of the established educational institution.

Efficiency or cost-effectiveness evaluation is continuously required if we are to assess the relative merits of traditional programs vis-a-vis proposed innovations. Faced with the possibility of "future shock" arising from a pace of change with which we cannot cope, we may deliberately choose to conserve some of our traditional programs and services. It is the task of evaluation research, however, to inform us of the cost of doing so.

The Professional Development of Evaluators

Our experience in the evaluation of Project SEARCH has led us to conclude that evaluators of social services or development projects must acquire skills beyond those traditionally considered relevant and necessary to the conduct of basic research.

² In this context, the term "cost" is used in its broadest sense to include the surrender of anything valued by man whether it be material, social, or personal.

At minimum, those engaged in evaluation must be prepared to develop and rigorously adhere to a professional code of ethics. Under somewhat humorous categories, Suchman (1967) lists several forms of evaluative "abuse" (ie., unethical practice). The *eye wash*, for example, is a biased evaluation which reports only those aspects of a program which make it "look good." The *white wash* diverts attention from program failure by soliciting "testimonials" from selected converts. The *submarine* is an attempt to destroy a program completely in order also to "sink" both the project and its personnel who may have been uncooperative or a source of constant clash for power or prestige. The *pose* is an effort to provide the style, if not the substance, of scientific respectability. In the latter regard, once again, it must be emphasized that an evaluation design, of necessity, will often fail to satisfy the canons of scientific rigor. Although the evaluator must be sufficiently flexible to make necessary compromises or trade-offs it is incumbent upon him, nevertheless, to openly acknowledge the limitations of his evaluation procedures, his findings, and the recommendations, if any, which he is prepared to make.

Since the major purpose of evaluating any project or service is to provide valid information for future decision-making, evaluation must strive to be informative rather than merely judgemental. If evaluation research is to serve the growing demand for useful information upon which to base social-policy decisions, it must grapple with socially relevant and therefore *value laden* questions. Furthermore, it must do so in a credible way. In order to achieve and maintain credibility, evaluators must be willing to make explicit the value assumptions which underly their own efforts. Moreover, they may well consider the possibility of exploring and reporting the side effects or unanticipated consequences of a particular course of action from the perspective of the diverse value orientations held within a pluralistic society.

Finally, but of critical importance, is the human relations aspect of evaluation research. If the evaluator is to establish dynamic working relations with service or project personnel, who understandably may be somewhat apprehensive regarding the prospect of evaluation, but who ultimately must make effective use of evaluative inputs, he must develop those skills of communications and interpersonal relations which permit him to do so. Our experience in the evaluation of Project SEARCH leads us to suggest that human relations training may be quite as important for the professional development of the evaluator as, say, statistics and research design for the professional development of the counselor. The evaluator, especially he who purports to conduct formative evaluations, has no option but to develop competence in both scientific methodology and interpersonal communication.

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Demonstration and Testing of Individually Prescribed Instruction

The Individually Prescribed Instruction Project was designed to focus on one aspect of HRRC's program on individuality. Materials developed for individualized instruction in mathematics by the Learning Research and Development Center at the University of Pittsburgh and by Research for Better Schools, Inc., are being field tested in three Alberta schools located in three different school systems, two urban and one rural. The terms of the contracts between HRRC and the three school systems, some prerequisites for success, and the characteristics of IPI are discussed in this article. Specific attention is given to cost factors and other considerations in the implementation of Individually Prescribed Instruction.

The general purposes of the Human Resources Research Council were interpreted by Downey (1968, pp. 4-5) to include:

1. the conduct, or sponsorship, of *basic research* designed to fill gaps in existing knowledge in appropriate domains;
2. the collection, *codification*, interpretation and dissemination of available knowledge for use by policy makers and others;
3. the *development* of plans, materials and processes for use by practitioners in fields related to human resources development or conservation;
4. the design and *monitoring* of programs of change;
5. the encouragement and support of *training* programs for researchers and developers in appropriate areas; and
6. the *informing* of all citizens of emerging trends and problems in the area of human resources development and conservation.

All of these objectives, and their corresponding research and development activities, are summarized in the following figure.

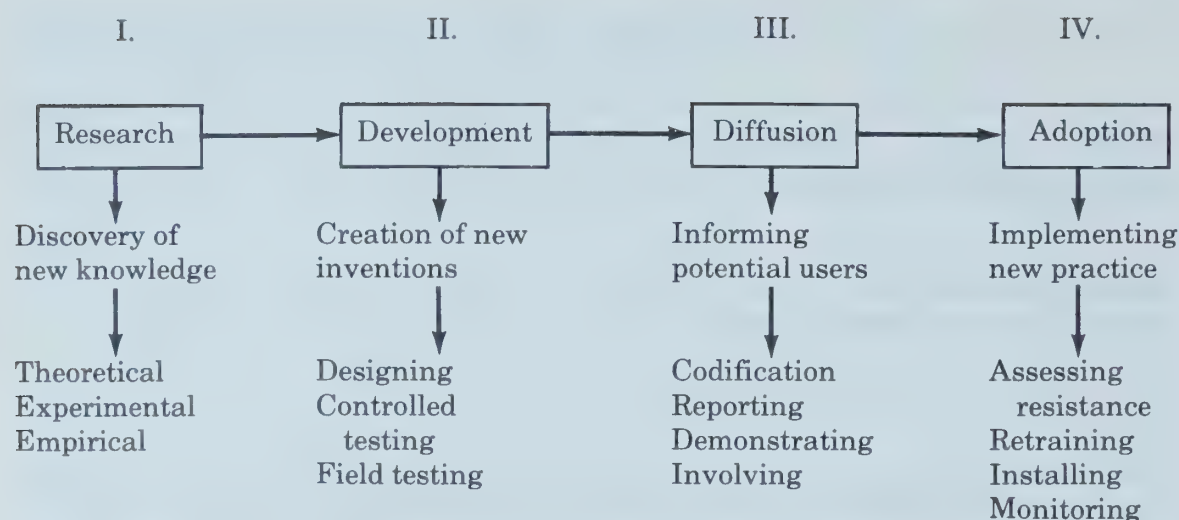


Figure 1. Research and Social Innovation

In accord with the basic components of research and social innovation, HRRC organized its operations into two major areas: (a) Planning and Policy Studies, and (b) Research and Development Studies. All of the studies in the R and D area were in the field of education. These were categorized under two major programs: (a) Studies in School Community Development, and (b) Studies of Individual Development.

Program Area 400: Individuality was envisioned as a comprehensive research and development program addressing questions related to the development of individuality in a variety of ways. The program emphasized the development of children and youth—in particular, the school experience of these age groups.

The nature of individuality itself was a major question raised for consideration. Although knowledge about individuality and the applied aspects of it was very limited, the assumption was made that relationships can be uncovered between such qualities as capacity for self-direction and willingness to assume responsibility on the one hand, and certain conditions prevailing in the lives of children and youth on the other. The conditions of schooling, in particular, were of interest to the staff. Much of the proposed program was devoted to research and development projects pertaining to the conditions of schooling as they related to the development of individuality. Considerable attention was given to planning programs for exploring means for individualizing learning.

Focus and Design of the IPI Project

Initially, the Program on Individuality consisted of four research and development projects which were as follows:

401. Baseline Study: Conditions of Schooling Related to Individual Development;
402. Individually Prescribed Instruction;
403. Studies on the Nature of Individuality;
404. Computer-Assisted Instruction.

The rationale, objectives, anticipated outcomes, research activities and staff capability required for Project 402 (Individually Prescribed Instruction) were briefly described in the initial *Prospectus* (Downey, 1968, pp. 35-36) as follows:

Rationale

The Learning Research and Development Center at the University of Pittsburgh initiated work on Individually Prescribed Instruction (IPI) systems some years ago. In recent years, their efforts have been supplemented by Research for Better Schools, Inc., (RBS) a non-profit regional educational laboratory sponsored by the U.S. Office of Education, which field tests, evaluates, and modifies IPI systems. Of the work carried out to date under the research and development center program of the U.S. Office of Education, IPI systems are the most advanced.

Since the major work on IPI systems had been with mathematics and reading programs at the elementary level, it was with these systems that the Council's IPI project would begin. Developmental work in education requires such a high level of expenditure that collaborative activities with other R and D centers would seem to be essential as a matter of policy. The collaborative work proposed would be the first expression of this policy.

Objectives

Initially, the objectives set out for the project were:

1. To establish one or more demonstration/testing centers for IPI materials;
2. To undertake further developmental work with IPI systems in co-operation with the Learning Research and Development Center (University of Pittsburgh) and Research for Better Schools, Inc. (Philadelphia, Pennsylvania);
3. To assess the applicability to Alberta schools of developed IPI systems; and,
4. To disseminate research and development findings on IPI systems to educators throughout the province.

Anticipated Outcomes

In addition to the findings implied by the project objectives, the following outcomes were anticipated:

1. An early start (involving modest expenditures) in research and development activities leading to the creation of tested educational alternatives for use in Alberta schools.
2. Establishment of working relationships with other R and D centers in studies of mutual interest which can accelerate development of Council programs.

Research Activities and Staff Capability Required

Five major phases of the project were conceptualized as follows:

<i>Phase</i>	<i>Activities</i>	<i>Staff</i>
I—to April, 1969	Recruit project coordinator and staff and begin negotiations with cooperating school systems; negotiate agreement with RBS for testing and development of IPI systems.	Core staff of Council
II—to September, 1969	Summer training institute for teachers in the demonstration/testing schools; further development of IPI systems; develop evaluation design for appraisal of the IPI systems undergoing test.	Project coordinator Administrative assistant Research/Development Team (4) Principals and teachers (2-week summer Institute)
III—to April, 1970	Testing and development work; decisions as to the scope of the second year's operation.	Staff as shown above
IV—to April, 1971	Testing and development work; dissemination of findings from the first year of operation;; decisions as to scope of the third year's operation.	Staff as necessary, given decisions as to the scope of the second year project
V—to April, 1972	Project evaluation; decision as to whether the project should enter a second phase or should terminate; dissemination of findings.	Staff as necessary

In order to carry out the objectives of the IPI Project, contracts were negotiated with three school systems. The three school systems were the Edmonton Public School District, the Calgary Separate School District, and the Foothills School Division. During the early months of 1969, three experimental schools and three control schools were selected. The urban sample was selected, in part, on the basis of the socio-economic status of the community. The schools ultimately chosen, in consultation with central office administrators, were as follows:

<i>System</i>	<i>Experimental Schools</i>	<i>Control Schools</i>
Edmonton System (Lower Socio-Economic Sample)	Forest Heights School	Princeton Elementary School
Calgary System (Higher Socio-Economic Sample)	St. Vincent de Paul School	St. Leo's School
Foothills Division (Rural Sample)	Millarville School	Red Deer Lake School

When schools were tentatively identified for participation in the Project, teachers and administrators were informed as fully as possible about

IPI. Teachers who did not wish to take part were given the option of transferring to another school. Out of a possible total of thirty-three teachers, five chose to transfer to other buildings, although none of these did so because of IPI.

In the original contracts with the three systems, HRRC agreed to underwrite the cost of:

1. consultant services;
2. all prepared instructional materials for the mathematics program; Grades 1-6 (approximately \$12.00 per student each year);
3. a two-week retraining workshop for the principals in Seattle, Washington; and,
4. a two-week retraining institute for the teachers in Banff, Alberta.

As part of their contribution, the school systems were expected to assume responsibility to:

1. provide a control school and an experimental school, along with the corresponding students, staff and storage facilities for instructional materials;
2. supply the appropriate number of teacher-aides; and,
3. free the principal for a two-week period in April so that he would be able to attend an administrators' retraining workshop.

In summary, then, the applications from the three school systems and the design of the IPI development project were based on five criteria:

1. *Administrative Commitment*—The school board, a central office administrator and the principal should have a thorough, first-hand knowledge of the essential elements of IPI Math. They should also be fully informed of the administrative requirements of the program.

2. *Teacher Commitment*—Teachers must be involved in the selection of IPI Math for their school to insure the high level of teacher commitment which is so important to the success of the program. This should include thorough briefings on the elements of IPI and its implications.

3. *Need for Retraining*—There is a significant need for both administrator and teacher retraining when a school adopts IPI Math. The school system should be fully aware of the nature and extent of this retraining.

4. *Research Participation*—Both administrators and teachers should know in detail the research questions that are being asked, the kinds of data that will be collected, the method of data-collection, and the work involved in that operation. They should also be aware of the need for attitude surveys to be conducted with both teachers and students, the possible request for additional achievement testing, and other contingencies which make demands on school personnel.

5. *Uniqueness of Situation*—This involved consideration of the individual school history. Is the school ready for individualization? Has the school been involved in innovation? Has it attempted in any way to prepare for individualized instruction? Does the school present a suitable climate for Individually Prescribed Instruction?

Characteristics of Individually Prescribed Instruction

The principal goal of education is to create men who are capable of doing new things, not simply of repeating what other generations have done—men who are creative, inventive, and discoverers. The second goal of education is to form minds which can be critical, can verify, and not accept everything they are offered. The great danger today is of slogans, collective opinions, ready-made trends of thought. We have to be able to resist individually, to criticize, to distinguish between what is proven, and what is not. So we need pupils who are active, who learn early to find out by themselves, partly by their own spontaneous activity and partly through materials we set up for them. . . . (Elkind, 1968, p. 80).

The above quotation from Jean Piaget adequately describes the broad goals of Individually Prescribed Instruction. In order to bring about such behaviors in students, the developers of IPI—Glaser, Bolvin, and Lindvall of the University of Pittsburgh—have attempted to use information about individual differences in order to prescribe appropriate educational environments.

Individually Prescribed Instruction is an instructional system based on a set of behavioral objectives which are correlated with diagnostic instruments, curriculum materials and teaching techniques (Scanlon and Bolvin, 1969, p. 5). It represents one specific way of providing for the wide ranges of differences which exist in classrooms. Certainly it typifies what can be done to help students progress at their own rates and in their own program of studies.

In its present stage of development, the objectives of the IPI Program are:

1. To enable each pupil to work at his own rate through units of study in a learning sequence;
2. To develop in each pupil a demonstratable degree of mastery;
3. To foster the development of problem-solving thought processes;
4. To develop self-initiation and self-direction of learning; and,
5. To encourage self-evaluation and motivation for learning (Scanlon and Bolvin, 1969, p. 5).

With respect to the first objective, provision must be made for:

1. Differences in level of achievement among students within a given class. This requires that the system be structured so that teachers can determine what each child knows in each area of the curriculum.
2. Differences in rate of learning toward specific goals in the curriculum. In the elementary school, particularly, there is a set of learning goals that is common to approximately all students. In order to maximize each pupil's rate of achieving these goals, it is necessary to restructure the materials, the techniques of instruction and the learning settings. Hence, the system has to be adaptable to at least the gross learning styles of the students.
3. Establishing different learning goals for different students. In the upper levels of the elementary program, the determination of which goals to establish for which student requires a joint decision of the child and

the teacher depending upon the child's past experiences, achievement, and the structure of the subject matter.

Closely related to the first objective is the goal of mastery of subject matter. The assumption is that most children can master their subjects if the instructional environment can adapt to their requirements. Mastery, in the IPI program, is defined as a specified proficiency level for a given objective plus a specified retention level over a longer period of time. This concern for mastery means that provision must be made for various amount and kinds of practice, various amounts of time to achieve mastery, and various instructional techniques.

The development requirements (Bolvin and Glaser, p. 830) to meet these objectives can be thought of in terms of six elements which distinguish IPI from conventional school procedures:

1. Detailed specification of educational objectives. The outcomes of learning are specified in terms of observable competence and the conditions under which they are to be exercised. Vague specifications of desired outcomes leaves little concrete information about what the educational process should strive to attain. Interaction between the specifications of outcomes in relation to instructional procedures provides a basis for redefining the objectives. There is a sustained process of clarifying goals, working toward them, evaluating progress, re-examining the objectives, modifying instructional procedures, and clarifying the objectives in light of evaluated experience. Ideally, this process should highlight the inadequacies in a program.

2. Organization of methods and materials to attain these objectives. Alternative instructional procedures are selectively assigned to the student or made available to him for his selection. In many respects, the materials are the key to providing an individualized program that is both workable and economically feasible. They have to be developed, in keeping with subject matter requirements, for some degree of self-study. Without this option available, the amount of teacher help needed would be unmanageable. For this reason, the emphasis to date in the IPI Program has been in the development of materials that can be self-instructional.

3. Careful determination of each pupil's present competence in a given subject. Without careful assessment of initial learner characteristics, carrying out the educational procedure is presumptuous. The diagnosis of the initial state includes not only assessment of the learner's knowledge of prerequisite behavior but also the assessment of his aptitudes, his learning style preferences, and his perceptual and motor skill capabilities. This accumulated diagnosis must be especially relevant to the immediate instructional step that is to be taken.

4. Individual daily evaluation and guidance of each pupil.

5. Provision for frequent monitoring of student performance in order to inform both the pupil and the teacher of progress toward an objective. As the student proceeds to learn from the instructional procedures made available to him, his performance is monitored and continuously assessed—at short or long intervals, appropriate to what is being taught.

6. Continual evaluation and strengthening of the curriculum and instructional procedures. The system has inherent in its design the capability for improving itself in that it provides a cumulative bank of knowledge on which improvements can be made.

The special characteristics of IPI are depicted in Figure 2 (Scanlon, 1970, p. 45).

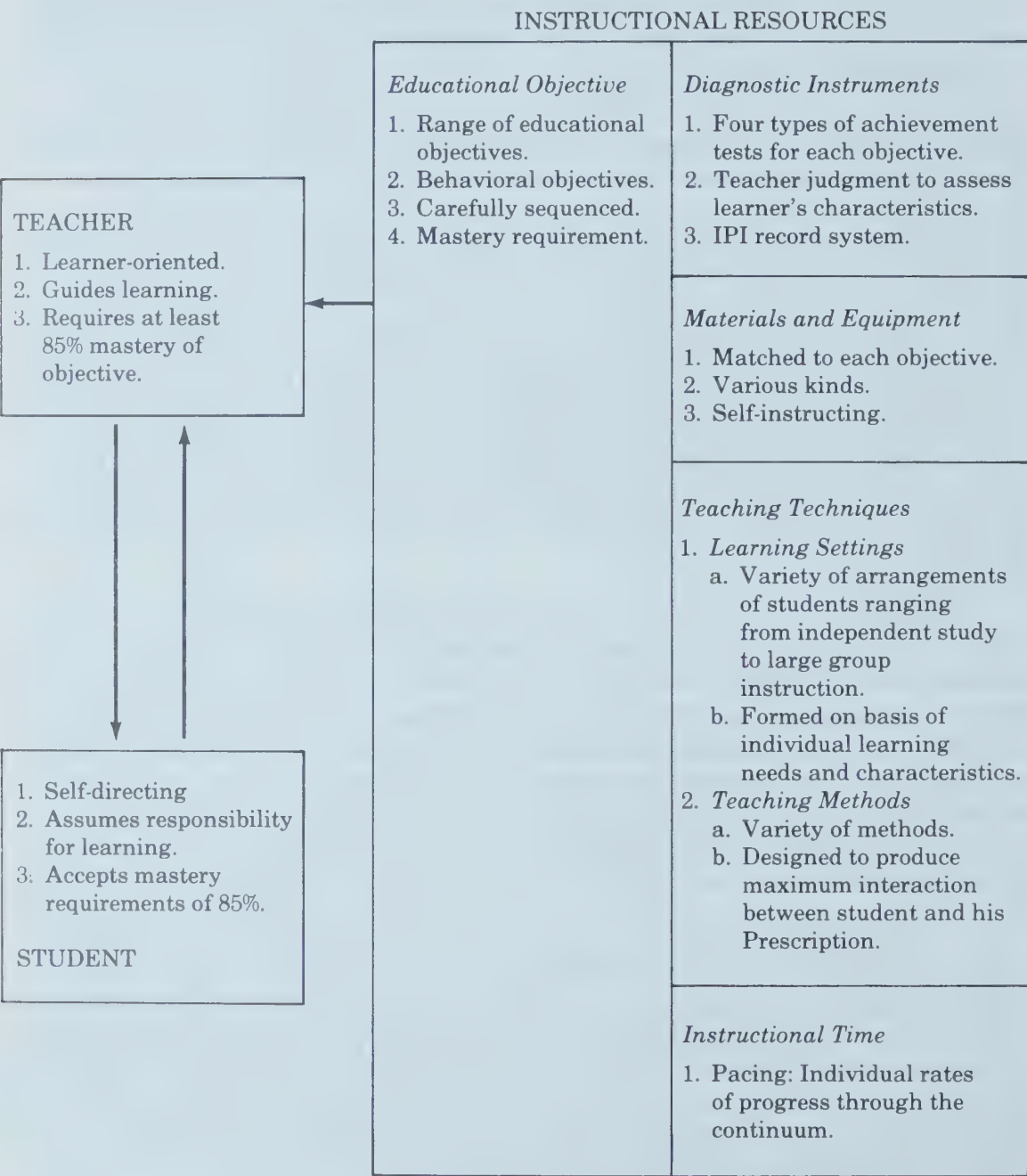


Figure 2. Special Characteristics of IPI

Four types of diagnostic instruments are used in IPI. These include placement tests, pre-tests, post-tests and curriculum-embedded tests. Placement tests are administered at the beginning of each academic year

to determine general placement of each pupil in each subject-matter area. The information obtained from the placement test shows whether the student gained, lost, or retained the proficiency he showed at the end of the previous school year.

A second set of instruments used, the pre-tests, measure each of the objectives within a particular unit. Mastery of any of the objectives, as indicated on the pre-test, means that the child can skip these particular objectives and concentrate on those objectives which he has not yet mastered.

Post-tests and curriculum-embedded tests are also used to assist the student and the teacher in making decisions as to when the child is ready to move to the next learning tasks. The curriculum-embedded tests are short check tests embedded within the materials for each objective, while the post-tests are alternate forms of the pre-tests given at the end of a unit as a final check for mastery.

Cost Factors in IPI Mathematics

During the initial year of operation, 1969-70, the cost of IPI materials supplied by Research for Better Schools was \$12.00 per student.

In the second year of operation, 1970-71, the following variable scale was introduced, which was dependent on pupil enrolment:

0- 99	students	\$11.00	per student
100-199	"	10.50	"
200-299	"	10.00	"
300-399	"	9.50	"
over 399	"	9.00	"

Informal indications are that costs can be expected to become still lower in the next few years, for two basic reasons. First, the initial period of program development, with its enormous associated costs, is virtually over. Second, the IPI mathematics "package" appears likely to be turned over to Appleton-Century-Crofts Publishing Company for commercial production in the near future.

Whether these factors alone can bring the costs of IPI mathematics into line with prices of existing mathematics textbook series remains to be seen.

The costs described so far, however, represent only a part of the total financial commitment necessary for the implementation of IPI mathematics. RBS provides the following example of a typical budget for a 450 student, 18 room elementary school entering IPI mathematics:

Training:	
Administrative per diem 10 days x \$30/day	\$ 300.00
18 teachers x 2 weeks x \$150/week	5,400.00
Teacher materials 18 x \$10	180.00
Teacher-aide materials — % Aides x \$5	25.00
Sub-total	\$5,905.00

Teacher-Aides:	
5 aides x \$3,000/annum	15,000.00
Planning Time: No additional staff needed	
Student Materials: 450 x \$10	4,500.00
Shelving:	500.00
Grand Total	\$25,905.00

Experiences in the HRRC IPI Pproject to date have indicated certain modifications to the RBS (Research for Better Schools) budget description are possible.

The Administrative Training Program is a definite commitment, and the cost indicated is reasonably accurate. However, teacher training can be accomplished in any number of ways, depending upon the situation and the resources available. An intensive training program conducted a few days before the beginning of school would probably be adequate, if that is all that time and resources allow. Obviously, the more experience teachers have with IPI, the more confidently they will be able to deal with their classes but the suggested two week training period seems liberal in any case.

The \$10.00 per teacher cost associated with teacher materials refers to the teacher training manuals (6 volumes in 1969-70) which are sent to each prospective IPI teacher. This cost is compulsory, as is the related cost of teacher-aide materials, which consists of a training manual, along with a record-narrated filmstrip.

RBS suggests that one teacher-aide be employed for every 75-100 students. While this is a desirable ratio, it is possible to operate the program with few paid aides. One full-time aide seems indispensable, but parent volunteers appear to be able to carry the remainder of the load very well. In larger elementary schools, particularly, the use of parent volunteers to assist with marking and recordkeeping seems to be a necessity, unless an extremely large number of paid teacher-aides can be employed.

The cost of student materials is also a very flexible item. In distributing IPI materials, RBS provides only programmed paper and pencil materials in work-book format. Any manipulative aids or other mathematical materials must be provided by the school. As in any mathematics program, certain supplementary mathematics materials have been found necessary for effective implementation. It should be added that two expenses which are peculiar to IPI will have to be included in the cost of materials. One is the cost of some form of portfolio folder for each student to carry his mathematics materials. The other is some form of "tote box" to carry the students' math folders. Neither item need be extremely expensive, but nonetheless is worthy of consideration.

The final item mentioned in the sample budget, shelving, is once again a flexible one. All that can be said with certainty is that some form of storage space will be required; ideally it will take the form of low, accessible shelves, from which students can readily draw their own materials,

or, as in the case of one of the project schools in Alberta, filing cabinets have been used. For a 15-20 room elementary school, the equivalent of an entire classroom is ordinarily required for the storage of adequate quantities of the approximately 485 different booklets used in the program. The \$500.00 figure for shelving is a realistic one, covering the cost of constructing adequate wooden shelves designed specifically for the storage of IPI materials.

In addition to the costs described by RBS, other costs, peculiar to Canadian participants, are worth mentioning. Two relatively small, but inevitable expenses, are postage costs and customs charges. Postage must be paid for all materials sent to Philadelphia—the most expensive of which involve the shipment of sample forms and materials required as part of each school's research commitment to RBS. Charges associated with customs clearance, for example, brokerage fees, will be incurred every time a shipment of materials is received. Apart from these instances IPI materials are shipped totally pre-paid, so that no shipping expenses should be involved.

The final cost consideration is also an optional one, and it relates to the curriculum materials themselves. Because the materials are American, the money units—which occur at nearly every level—contain pictures of American coins and bills. This, coupled with the fact that the reproduction of the coins was very inadequate, motivated HRRC to undertake a “Canadianization” of the IPI money units containing pictures of American money for the three project schools. This activity cost approximately \$400.00, and involved the multilith reproduction of 22 booklets, in adequate quantities for all three schools.

In summary, it may be said that IPI is an innovation based on research which uses current information to improve its techniques, procedures and materials. Hopefully, this report will add to the growing number of publications which are attempting to disseminate information about IPI systems.

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Evaluation of The IPI Project

The evaluation of the IPI mathematics project in three Alberta schools is described. Data were collected on student achievement, student attitudes, teacher attitudes and parents' opinions. In a comparative study of student achievement, the results tended to favor the set of Control schools. In areas of student and teacher attitudes the reverse was true. Parental opinions were found to be generally favorable to the program. Project administrator reports are described and implementation problems are discussed. The present paper is a much-shortened form of a report presented to the Alberta Human Resources Research Council.

In the spring of 1969, three schools were selected as sites for the establishment of demonstration/testing centres for IPI Mathematics. Two urban schools were selected as representative of two broad socio-economic classes. One of the schools served a predominantly lower middle class neighbourhood while the other urban school was located in an upper middle class area. A third school was selected to represent the rural situation. The three school systems in whose jurisdiction the demonstration schools fell were asked to nominate a second school which most nearly matched the demonstration school in terms of facilities and area served. In the report that follows, these schools will be referred to as Control schools, although it is important to realize that from an experimental point of view, they could not be considered as equivalent to the IPI schools in any more than a general way.

In September of 1969, IPI mathematics was installed in the three IPI schools. As the project developed the major emphasis was placed on the third objective. In line with this, the evaluation activities were also concentrated on investigating the applicability of the IPI Mathematics system to Alberta schools. To this end, during the first year the evaluators undertook to examine IPI mathematics from two points of view, process and outcome.

Two broad procedures were used in the evaluation. Comparisons were made between the IPI and Control schools on many of the variables. In addition, and perhaps more importantly, observations, opinions and judgements were elicited from students, teachers, parents and administrators in the IPI schools.

Achievement data, and some attitude data were collected in October of 1969, and again in May of 1970, in an effort to detect changes that might have occurred during the first year of the project. Interviews with teachers and parents were made during February of 1970, after they had a chance to get by the initial disruption of installation, and had experienced enough of the program to form valid opinions. All of the results presented in this report refer to the first year of the project.

Process Evaluation

Two kinds of processes were involved in the IPI Project. The first process consisted of the installation of IPI in the schools. The data concerning this process were the observations and opinions of two of the administrators who had responsibility for running the program. A qualitatively different kind of process was investigated by looking at the activities in the classroom themselves. A comparative study of the teacher-student interactions was made to see if any differences in classroom processes were detectable.

Evaluation of Program Implementation

Pacey (1971a) and Holmes (1971), two of the administrators involved in the implementation of IPI, maintained sets of notes describing the problems and successes that were encountered in the application of IPI during the first year. From their reports, several interesting results were noted.

During the first month of operation, all of the children had to be placed on the IPI continuum. This required the testing of all of the children to determine the level at which they should enter the program. The procedure proved to be tedious and often exhausting, but since complete placement testing is only required when the program is first introduced to the school, the task was a bearable one. In succeeding years, September placements for most students can be made on the basis of their June locations on the continuum.

Also, in the first month, the schools needed extra help in carrying out the many tasks of recording, prescribing, testing, marking, and distributing materials. Because the teachers were not yet intimately familiar with the materials, more than the usual help was needed. The school administrators spent a considerable amount of time in the classroom working with the teacher and students in an effort to alleviate the problem. This not only provided the extra manpower necessary to overcome the initial starting pains, but had the side effect of promoting a spirit of unity among the staff.

Because of the magnitude of the individualization task, the first month was particularly inefficient for the students as well. Some students spent as much as three quarters of their time standing in line, waiting to have materials corrected or assigned. Two solutions to this problem were used. The children themselves were given more responsibility in marking their own work, and obtaining materials from the storage rooms. Secondly, since the city schools

obviously needed more teacher assistance for the clerical chores, parent volunteers were obtained from the communities. Typically two volunteers were used in each math class.

Among the other initial difficulties was the problem of the placement tests. Children who had grown accustomed to the traditional purposes of testing, often had difficulty accepting "failure" in placement testing. However, after a month's experience with the program, their understanding of the role of the placement test allowed them to see it in its proper perspective.

The administrators of the IPI program in each school were trained at a demonstration school in the United States. At that school, the IPI guidelines were rigidly adhered to. Within the Alberta situation, no attempt was made to follow the guidelines exactly. The teachers of each school tried to fit the program into the contexts of their own situation. In grade one for example, one school used the IPI materials from the outset, but used additional mathematics readiness materials at the same time. At another school the children in grade one were phased into the program in three groups as they became ready. In general the teachers tried to follow the IPI program, but felt free to deviate from the enunciated procedures whenever their professional judgement dictated it.

The effects on the children, as observed by the administrators was important. Almost all of the children were excited by the program. Undoubtedly some of this could be attributed to the novelty of the program, but that is not necessarily a bad thing. There were no new discipline problems caused by the increase in freedom, and some of the old problems (a few of the so-called lazy children) seemed to disappear. Some of the children were bewildered and frustrated by the complex system, but the number was not nearly as many as the staff had expected. The vast majority of the students adjusted quickly and enjoyed their work so much that they were reluctant to be taken out of their booklet work to work on some enriching activities in seminars. There seemed to be a lingering competitiveness that made some of the children push to keep ahead of their friends.

For the teachers, the work at the beginning was hard. Later, as they became more accustomed to the system, they began to sense a different kind of problem that was caused by the IPI system. In traditional group teaching situations, individual learning problems are often overlooked in the attempt to achieve some overall mastery by the majority of students. In IPI, the problem does not go away as the student moves from one topic to another, because he cannot move until he has achieved the goal. As a result, teachers were forced to deal with individual learning problems and were astounded by the complexity of the learning process. Despite the difficulties, the teachers were generally positive in their feelings toward the program, although they were critical of many of the specifics of the curriculum.

Five general problems were detected by the administrators.

1. The curriculum materials that were used to teach the money units, all used American coinage; these units were changed to fit the Canadian scene.
2. The project was plagued with problems in shipping, both in terms of late shipments, and improperly filled orders.
3. There were many printing errors in the materials and answer keys.

4. the units designed for the first grade students, required a greater ability to read than most students possessed.

5. Uncertainty in the organization of the funding agency was disruptive of morale in the schools.

In the minds of the participant-observer administrators, these five problems were more than compensated for by the enthusiasm of the learners and teachers.

Classroom Interaction Evaluation

Some critics of IPI suggest that because of the individualized nature of the program, the children lose valuable opportunities for developing social skills. In an effort to determine what differences in classroom interactions existed between the programs, Pacey (1971b) carried out a comparison of the verbal behavior patterns in the experimental and control schools using the Flanders method.

All teachers in grades three to six in all six schools were observed for twenty minutes each. In all there were 16 hours of observation time. The observations were made in March and April of 1970.

The analysis of the interaction matrices indicated several differences between the two groups. The results were summarized by Pacey as follows:

1. More information was provided directly by the teacher in IPI. Closer examination revealed that this tendency was general throughout the matrix. That is, IPI teachers tended to precede and follow student talk with their own thoughts and opinions more than did teachers in the control group. There was no other significant build-up elsewhere, for example, use of extended lecture was about the same in both groups. This indicated that rather than taking time to build on student ideas, IPI teachers tended to explain answers quickly and move on, which may suggest that the IPI system is rushing teachers.

2. IPI teachers made less use of questioning. The pattern for this is consistent with number one. These two differences would seem to be significant because the IPI system claims that teachers should avoid telling students answers, but rather should encourage them to discover answers for themselves, by leading them there via careful questioning.

3. There was substantial increase in student talk in the IPI group, especially student-initiated talk. This is certainly, at least in part, due to the system, in which students come to the teacher for assistance or guidance, usually at their own initiative. But careful analysis of teacher reaction to student talk indicated that the teachers in the IPI group seemed to encourage it.

4. Related to increased student talk was the dramatic increase in extended student talk. When a student began talking to the teacher, he was allowed to talk for sustained periods of time more frequently in the IPI group than in the Control group.

5. A significant increase was evident in the use of motivating and encouraging teacher behavior in the IPI group. Although use of these behaviors was not very extensive, it was higher than in the Control group. This, of course, may be due to differences between the schools, but it might also be

attributable in part to the IPI system, which allows one-to-one interaction on a far greater scale than normally.

6. There was a corresponding decrease in the use of controlling teacher behaviors in the IPI group. That is, IPI teachers tend to give directions and criticism less often than did the Control teachers. The IPI system would seem to account for the decrease in giving directions, since the materials do much of that. The decrease in criticism might be partly attributable to the system, which is success-oriented and gives students a fair amount of freedom.

7. There was less use of extended indirect teacher behavior in the IPI schools than in the Control schools. This may suggest once again that teachers do not have enough time to adequately develop and encourage student ideas and feelings.

Because IPI had only been in the schools for six or seven months at the time of the observations, the study was viewed as exploratory in nature.

Outcome Evaluation

The outcomes of the program were examined in two ways, comparatively, and judgmentally. Two general kinds of effects were investigated, achievement, and attitude. The attitude effects were investigated with students, teachers, and a sample of parents.

Comparative Study of Student Achievement

In an effort to evaluate student achievement in mathematics in a comparative way, two subjects of the Canadian Tests of Basic Skills (CTBS) were administered to the students in grades 3, 4, 5 and 6 in the IPI and Control schools. The CTBS is a version of the Iowa Tests of Basic Skills adapted for use in Canadian schools. The two subtests used in the evaluation were Arithmetic Concepts and Problem Solving. These tests were designed to reflect the skills and objectives pursued in most existing textbooks. The Arithmetic Skills test contains items measuring concepts involving currency, decimals, equations, fractions, geometry, measurement, numerals and number systems, percents, ratios, and whole numbers. The Problem Solving test includes problems that involve the kinds of operations and concepts that generally appear in the first half of textbooks for a particular grade.

The tests were administered in September and May of the first year of the program. At each grade level an analysis of covariance was carried out on both the Arithmetic Concepts and Problem Solving tests to see if there were significant differences in the May means after adjustments were made for differences that existed in September.

The results of the analysis for both tests showed no significant differences at grades 4 and 5. For grades 3 and 6, the adjusted mean for the Control group was significantly higher than that of the IPI group.

In all cases, the differences in adjusted averages, did not exceed 2.25 points. The individual school averages for the May testing were compared to the norms for school averages provided by the publishers of the test. These norms indicate the percentile points for grade averages when the tests are administered after April 1. For the six schools in the study, and four grade levels in the study, only two grades of the 24 were below the 50 percentile

on Arithmetic concepts, and only five grades were below the 50 percentile on Problem Solving. This record indicates that all of the schools seem to be doing a remarkable job (in relation to the schools used in the norming procedure) in preparing their students in areas measured by the CTBS. Thus, even though differences that exist favor the Control group, this should not be taken to mean that the results for the IPI group are poor.

In an effort to determine whether or not there were any differential effects of the program for different ability levels, the data were reanalysed with the students categorized into ability levels. The Lorge Thorndike Verbal and Non-Verbal Intelligence Scales were used separately to categorize the students into three broad intellectual groups. Because the test was administered at the same times as the CTBS, it was possible to place students into the three groups according to their September and May scores. Only data for students whose I. Q. scores fell within the same category on both administrations of the test were used in subsequent analyses. The categories were defined as I.Q. scores of 95 and below, 96-115, and above 115. Once the students had been classified by ability, students from each category were selected at random until there were equal numbers of students in each category defined by the IPI-Control dimension and the high, medium, low ability dimension.

In all analyses, the September score on the CTBS scale was used as a covariate in an attempt to partial out differences that existed among the groups on the September testing. In one way, the analysis is really an analysis of gains made over the year. In the analysis, it was expected that the higher ability levels would gain more than the lower ability levels so that one would expect a significant difference among the ability levels. Differences between the IPI and Control groups might also exist as had been noted in the previous analysis, although some inconsistencies with the previous analysis might exist because of the smaller number of students used in the present analysis. The critical test, and the purpose of the present analysis was the test for the interaction between program and ability level. Presence of a significant interaction might indicate the effects of the IPI and Control programs on one ability level were different from the effects at another level.

The results of the analysis showed significant differences among ability groups, as expected, and between IPI and Control groups at grades 3 and 6 as shown previously. There were no significant interactions between ability groups and program. Since no interactions were significant, there is no evidence to suggest that either program is more effective at one level than at another.

Of course, the success or failure of a program cannot rest on a single or even two measures of educational achievement. Because the IPI program is generally conceded to be an innovation in method and not content, the CTBS Scale used seemed appropriate measures for determining gross differences between the IPI and Control schools. However, future evaluation should include finer instruments in order to be able to document specific differences between the groups.

Where differences did occur, (at grades 3 and 6), the Control group showed superiority. This may be due to a number of factors, each of which

must be considered for future evaluation and decisions. While the schools' curricula did not differ greatly in content, the sequence of material may have been able to account for the differences that occurred. The IPI sequence may have put them at a disadvantage in grades 3 and 6, or, on the other hand, the Control schools may have been at a disadvantage in grades 4 and 5. Another factor that may have accounted for the results is that the students at the different grade levels were different for the two programs. The analysis of covariance in the study was used in an attempt to overcome differences in CTBS scores that existed prior to the implementation of the program, it cannot be expected to make the groups "equal" however. Differences in teachers and classroom atmosphere could also have contributed to the results. Finally, it is also possible that the IPI program itself is not as strong at grades 3 and 6 as it is at grades 4 and 5.

Measurement of Student Attitudes

As one method of collecting information about changes in student attitudes over the first year of the program, a Student Questionnaire was administered to the students in grades 3 to 6 of the IPI and Control schools in September and May, (Maguire, 1971).

In general, the results of the questionnaire indicated that the students in the IPI schools at all grades liked mathematics better than their counterparts in the Control schools. A second finding was that more students in the IPI schools found mathematics easy, than in the Control schools. Both of these findings occurred at September and May which leads one to believe that there are additional factors operating beyond the IPI program itself. However, since the September administration was made after the children had been in school for almost a month, the month's experience may have caused the difference.

In addition to collecting attitudes toward arithmetic activities an attempt was made to evaluate some generalized student attitudes toward their environment. In May, a "pupil opinionnaire" developed by the staff at Research for Better Schools Inc. for use in their evaluation of student attitudes toward IPI was administered. This opinionnaire used a semantic differential format. Students were asked to rate eight concepts on 9 five point scales. The eight concepts were:

My School Is
Being Praised for Doing Something Well is
My Classmates Are
Working by Myself in School is
My Math Class is
Being Scolded for No Reason is
I am
Taking a Math Test is

The nine scales used were:

smart—stupid
happy—sad
easy—hard

fair—unfair
bad—good
slow—fast
nice—awful
useful—useless
boring—interesting

The instrument was administered to all students in grades 3, 4, 5 and 6. The responses were made anonymously. Because the instrument was being used on a speculative basis, the students were not required to indicate their grade level. As a result there were 497 responses in the IPI group and 542 responses in the Control group.

The differences between the average ratings of the IPI and Control groups were tested for each concept on each scale. In all there were 72 tests carried out.

For the concepts “Being praised for Doing Something Nice”, “Being Scolded for no Reason”, and “I am”, there were no significant differences on any of the scales. For the “My Classmates are” concept, the IPI group rated their classmates closer to the smart, fast, and good ends of those scales than the Control group. All other scales were not significant.

The “My School” concept showed significant differences on all scales except hard-easy. The “My Math Class” concept showed significant differences on all scales except useful-useless, where the average rating for both groups was next to the useful end of the scale. “Working by Myself in School” was significant on all scales except hard-easy and fast-slow. On all of the scales on which significance occurred, the IPI group means were closer to the smart, fair, interesting, nice, good, happy, easy, fast, useful ends of the scales than were the Control means. In all of these cases too the Control group was closer to the above ends of the scales than they were to the other end.

For “Taking a Math Test”, the IPI group rated it closer to the nice, interesting and happy ends of those scales. There were no significant differences on the other scales.

The interesting findings is that despite the extremely powerful test used (the degrees of freedom were over 1,000) not all of the tests produced significant results. In tests that involved general concepts such as “Being Praised . . . and “Being Scolded . . .” no significant results occurred. These results suggest that the scale may have some validity and that the IPI children are not trying to produce results that merely please. The self concept scale, “I am”, also showed no significant scales. The “Classmates” concept only showed three significant scales. In general, the concepts involving school experiences that were different for the two groups did produce significant results with the IPI group exhibiting some positive responses. Of course, one must note that the Control group responses were not negative. In most cases they were only slightly less positive.

As a result of the two questionnaires, it seemed fair to conclude that the IPI program as installed in the three schools of the study tended to produce a greater enthusiasm for arithmetic among the students than the Control program did for its students. This enthusiasm does not appear to be blind. On questions that do not reflect program characteristics, there appear to be few differences between the groups.

It is difficult to separate attitudes towards mathematics from attitudes towards the mathematics environment. We cannot conclude that IPI caused student enthusiasm. It may have been skillful teachers who produced this result and they may have done so using any innovative program. In future evaluation activities it will be useful to interview students so that the questions can be explored.

Comparative Study of Teacher Attitudes

In order to tap the general feelings that teachers in the IPI and Control schools have toward a number of Educational topics, an attitude instrument was constructed using the semantic differential format. Two kinds of topics were covered. The first set of topics: Innovation, Mathematics Education, and Individualized Instruction, were chosen because of their direct relevant to the project. The second set: Students, Teachers, Parents, and School System were included in an effort to obtain some measure of the general level of morale among the teachers.

The teachers in both groups were asked to rate the topics on the 29 adjective scales shown below. The instrument was administered in October and May.

Exciting—Dull	Systematic—Chaotic
Temporary—Lasting	Extravagant—Necessary
Authoritarian—Democratic	Worthwhile—Futile
Society oriented—Individual oriented	Ineffective—Effective
Traditional—Modern	Reflective—Impulsive
Difficult—Easy	Isolated—Integrative
Practical—Theoretical	Stationary—Moving
Enjoyable—Boring	Peripheral—Basic
Important—Useless	Inexpensive—Expensive
Concrete—Abstract	Frustrating—Satisfying
Good—Bad	Positive—Negative
Weak—Strong	Inadequate—Adequate
Precise—Vague	Not time consuming—Time consuming
Divergent—Convergent	Active—Passive

Two way analyses of variance were carried out on the judgements of each concept on each scale. The independent variables used were IPI versus Control group and October versus May testing. In all, 203 such analyses were carried out. Since there may be some very high correlations among scales, it is very likely that many of the results that are judged to be significant could have occurred by chance (even if the scales were independent, one would expect 5% of them to be significant.) Nevertheless, for the sake of simplicity of presentation and interpretation, the two way analyses were carried out. Most of the teachers responded anonymously, so that it was not possible to analyse the results properly, that is by taking into consideration the correlation between pre and post tests.

In considering the results, it is useful to keep in mind the rationale for carrying out the test. If participation in the IPI program (or factors concurrent with it such as Hawthorne effect) produced changes in teachers' attitudes that were different from changes that occurred in the Control group then a significant interaction should result. If there were a general change in attitude for both groups, then a pre-post test (Time) effect would be significant. If

the groups differed in attitude prior to introduction to the program, and this difference persisted throughout the program, then a significant Program effect would be noted.

In almost all cases, it was clear that even though one group rated "Innovation" for example, as being duller than the other group rated it, the average values for both groups fell on the exciting side of the scale. Thus such a result cannot be interpreted as one group's thinking that Innovation is dull and the other thinking that it is exciting, rather it is an indication that one group sees innovation as being more exciting than the other.

The results showed that only two interactions occurred. This seems to indicate that any differences between the groups may have existed prior to the first testing occasion.

Part of the result that the teachers' attitudes were different prior to the first testing occasion may have arisen from the intensive training program that was conducted. At a week-long course in IPI methodology that was held in Baff in August 1969 much enthusiasm was generated among the teachers for the program. The attitude scale was administered in late September and early October.

A second confounding factor was the degree of attention that was paid by the Control group to the scale. The Control group received no benefit from their participation in the program. In general the teacher attitude scales were administered after the Control group had been subjected to a batch of other tests in their classrooms and while the cooperation was good, one could not help but feel that the attitude scale was seen as an unnecessary imposition on the teachers' time. No indication of any attitude toward the questionnaire was received from the IPI group.

If one looks at the concepts individually, a picture of the teacher's attitudes begins to form. For the concept Individualization, the IPI teachers tended to see it as more exciting, lasting, democratic, individual oriented, modern, practical, enjoyable, important, good, strong, precise, integrative, moving, satisfying, worthwhile, effective, reflective, positive, adequate and active than the Control group. Again the responses indicate that the IPI teachers are generally enthusiastic about the program. It is interesting to note there were no differences on the time scale. This is one of the situations where both groups saw individualization as very time consuming. Similarly on the difficult-easy scale, both groups placed Individualization at the difficult end.

The Parents' concept showed significant differences on 17 scales, with the IPI teachers seeing parents as more exciting, lasting, democratic, easy, practical, theoretical, enjoyable, important, good, integrative, inexpensive, satisfying, worthwhile, effective, positive, adequate, not time consuming, and active than the Control group. The responses to this concept illustrate one of the problems with this technique. Often seemingly inappropriate scales such as temporary-lasting show differences among groups. With interviews, the reasons for the responses can be explored; with questionnaires, the reasons are left to the imagination of the interpreter. Two kinds of interaction with the parents were different for the two groups. Parent interviews were used in place of report cards for the IPI group, and parent volunteers were used to aid the teachers in the classroom.

For some of the scales it may have been this increased contact with parents that produced the results. In particular the responses to the scales such as enjoyable, satisfying and worthwhile might reflect this. On scales such as lasting and inexpensive, the IPI group may be referring to the effect that parents were having on the IPI program as a result of their volunteer activities.

Sixteen scales were significant for the concept Students. The IPI teachers rated this concept as more exciting, lasting, democratic, individual oriented, modern, practical, enjoyable, important, strong, precise, moving, satisfying, systematic, worthwhile, positive and adequate. Again, it is difficult to separate generalized reactions to students from reactions to students within the context of IPI. It seems safest to suggest that all of the teachers seem to have a high regard for students with IPI teachers giving slightly higher ratings on some dimensions. This may have resulted from more contacts with students on a one-to-one basis since the IPI system requires teacher-pupil conferences. Whether or not the actual time spent with individual students is greater in the IPI system has yet to be established.

IPI teachers rated Teaching as more exciting, lasting, democratic, individual oriented, modern, enjoyable, important, integrative, moving, effective, positive, adequate and active than did their Control counterparts. Both groups saw teaching as being practical, good, strong, complex, expensive, satisfying, systematic, necessary, worthwhile, and time consuming. It would seem that the teachers in both groups must be described as dedicated to their vocation. Large differences existed on two scales: democratic and individual oriented. These scales may reflect attitudes that are program specific.

Mathematics Education produced only nine significant scales. IPI teachers rated the concept as more exciting, democratic, individual oriented, integrative, moving, expensive, effective, and active. Many of these scales seem fairly closely related to the program. The attitudes toward Mathematics Education in a broad sense seem fairly similar.

The School System, the concept furthest from the IPI program, showed significance on six scales. The IPI teachers rated it more democratic, important, necessary, worthwhile, reflective and adequate. Perhaps, six scales represent a sort of chance level. None of these scales seems particularly important. In general, teachers' reactions to the School System seem to vary from neutral to fairly positive. One would not expect many differences here as the School System is quite remote from individual teachers.

Given the conditions under which the instrument was administered; that is after the program had been in operation for a month, one can see that it would be difficult to show the significant interactions suggested earlier. It does appear that the enthusiasm toward the program has not flagged over the year between administrations. In looking in general terms over the concepts and scales it seems fair to conclude that the IPI teachers have responded enthusiastically to the research that has been conducted in their schools. Much of this effect is likely due to either the novelty of the situation, or the special treatment given

to the schools, however, collection of similar data in subsequent years when the novelty effect has gone will indicate long term differences that exist in attitudes.

Teacher Interviews

Conners (1971) interviewed the 33 teachers who had worked with IPI for eight months in an effort to determine their opinions about the program. Six question areas were explored.

Question One: What perceptions do teachers have of IPI mathematics as an instructional package?

The study revealed that most teachers were extremely satisfied with IPI mathematics as an instructional package. The objectives of the program, the materials used, as well as the structure and flexibility of the program were considered as good, if not superior to most programs. However, more definite advantage were claimed for IPI over most other programs. In the opinion of the majority of teachers, IPI mathematics provides better for the "above average" and "average" pupils than most mathematics programs because it does not inhibit the pupils' progress. IPI also, through its variety of instructional approaches, appears to provide well for the different learning styles of pupils and allows pupils to work at their own pace. It must also be noted that after contact with IPI, all teachers in this study indicated their desire to individualize instruction in most other subject areas.

While IPI appears to have many "strengths," there appear to be some "weaknesses" in the program. The data suggest that IPI does not free the teacher from teaching the routine, basic skills of mathematics. It appears that efforts on the part of the teacher have now been transferred from a large group situation to an individual basis. The data also suggest that IPI, because of the structure and the pressures of the system, does not provide "well" for the student who wishes to pursue some special interests in mathematics.

Question Two: What perceptions do teachers have of the role of the teacher in the IPI system?

The data suggested that in the IPI system the teacher's role is changed from the traditional concept. The teacher lectures far less, works harder and has more demands made upon him in knowing the subject matter and curriculum. However, it appears that there is greater satisfaction working in an IPI classroom when compared to a conventional classroom because the individual contact with students allows the teacher more opportunity to assist the individual pupil than was previously possible in a conventional classroom. This satisfaction is enhanced because of the immediate feedback concerning the student's progress. The data also indicated that teachers in the IPI situation find their role to be more challenging, modern and professional than in a conventional classroom. It appears that IPI presents an opportunity for the teacher to work effectively with each individual in the classroom. The teacher is given an opportunity to become more "professional" as she becomes a "diagnostician" of learning, a decision maker and a guide for the pupil rather

than a "fund of knowledge." It appears therefore, that IPI creates greater opportunities for the teacher to use all her science and art as a teacher, in order to assist the individual pupil.

The data also suggest that contrary to some opinions, the IPI teachers do not find working in the IPI situation to be a "dehumanizing" experience for themselves or the pupils. In fact, it is suggested that IPI assists teaching and learning to become a more "humanizing" experience for both teachers and pupils because the teachers come to know and understand the students better as individuals.

Question Three: What perceptions do teachers have of pupil reactions to the IPI program?

Analysis of the teachers' perceptions indicated that most pupils react very favourably to IPI mathematics and prefer working in the IPI system to working in a conventional program. It appears that when pupils have been exposed to an individualized program of studies, then the majority do not wish to return to a "whole class" approach. It also appears that involvement in the IPI system fosters pupil initiative, self-confidence and responsibility, and that behavior problems decrease. Pupil motivation is extremely high in IPI, and in the opinions of teachers, more mathematics is covered than in a conventional program.

Question Four: What perceptions do teachers have of the role of the aide in the IPI program?

The study revealed that IPI could not operate effectively without the assistance of teacher aides. It appears that the aides are essential for marking and other clerical duties so that the teacher can devote her time to helping individual pupils. The data also indicate that the aides have become an accepted and integral part of the schools involved in the IPI project.

Question Five: What perceptions do teachers have of the ways in which IPI has influenced the organization, administration and functioning of the school?

The results indicated that teachers appreciate the opportunity given them to individualize instruction, that they do not wish to return to the "traditional" methods of instruction and that IPI has a positive influence upon their educational philosophies. It is also suggested that IPI need not interfere with the general administration of the school and that it can influence the behavior of the administrators by bringing them into the classroom more than normally. Administrators, because of this contact, are in a position to "get to know the pupils better."

Question Six: What perceptions do teachers have of the manner in which IPI has affected the school system and the parental community?

The study suggested several extremely advantageous aspects of IPI are related to the parental community. It appears that IPI can assist in the improvement of communication with the parental community because the use of volunteer (parent) aides can bridge the gap between school and community, and because pupil enthusiasm for the program is transmitted to the parents. Secondly, involvement of parent aides can engender more

parental support from the community. Thirdly, the detailed IPI records give teachers a more concrete basis to discuss a pupil's progress with his parents.

In addition to the major questions, four subquestions were explored.

Sub-Question One: Do teachers in schools situated in an urban, higher socio-economic area; an urban, lower socio-economic area; and a rural area, have different perceptions of the IPI program in mathematics?

The study revealed that there were no major differences between the perceptions of the teachers in the three schools, (one rural, one in an urban, higher socio-economic area and one in an urban, lower socio-economic area). However, the data do reveal some minor differences. They suggest that pupil peer rivalry is more likely to increase in an urban school, and especially in one situated in a higher socio-economic area. Teachers from the rural school were also more prone than teachers from the two urban schools to consider that their role had become more professional, while teachers in the urban schools considered their role as a teacher had become more modern. The only school that perceived IPI provided well for the "below average" pupil was the school in the urban, lower socio-economic area.

Sub-Question Two: Do teachers with different teacher training backgrounds have varying perceptions of the IPI program?

The results indicated that the professional training a teacher has received does not appear to influence her performance in IPI or her perceptions of the majority of the aspects of the program. It is, however, suggested that the more highly trained a teacher is, the more conscious she becomes of the need for adequate conferences and planning sessions, and the more training a teacher has, the less likely she is to expect assistance from the teacher aides.

Sub-Question Three: Do teachers with varying years of teaching experience have different perceptions of the IPI program?

The study revealed that the less experienced teachers were more likely to request and need additional inservice conferences, planning and training sessions. The less experienced teachers considered that their role had become more modern since the introduction of IPI, while the more experienced teachers perceived that the assistance of aides had helped to positively change their attitude toward teaching.

Sub-Question Four: Do teachers' perceptions of the IPI program vary according to the grade or class taught?

The study revealed that pupil attitudes and behavior were more likely to change in the upper elementary grades than the primary grades after contact with IPI. It is also suggested that teachers of the upper elementary grades are not as prone as teachers of the primary grades to involve teacher aides in actual "professional" work, and that they are more likely to favour individualization in "all" subjects. The data also revealed that IPI provides well for the "below average" student in the upper elementary grades, while it appears to provide "unsatisfactorily" for the "below average" student in the primary grades.

In summary, Conners' study (1971) showed that the teachers were generally pleased with the success of the application of IPI, but had a number of important suggestions for future development.

Parental Opinions of IPI

As a final component in the evaluation, Hoke (1971) interviewed a random sample of 35 parents who had children in the IPI program. Three kinds of opinions were solicited: opinions of the program as administered in the school, effect of the program on children, and opinions of personal communication and administration details connected with the program.

A number of questions were asked of the parents concerning their thoughts about the IPI program itself. In response to a question asking about the desirable features of the program, the five most common responses were:

1. Children can work at their own speed.
2. Teacher aides were hired.
3. There were benefits using parent volunteers.
4. There were benefits in parent teacher conferences.
5. Instruction was individualized which developed the child's own scholastic and personality strengths.

When asked for the least desirable features of the program, the five most common responses were:

1. The slow unaggressive or lazy child was not pushed and given enough teacher supervision.
2. Parents, unable to volunteer were not involved and were frequently not informed about the arithmetic concepts completed by their children.
3. Children did not take arithmetic homework.
4. The desk work of the teacher prevented her from circulating around the class to teach, encourage, or supervise.
5. The IPI student profile sheet had little meaning for comparative purposes.

In response to questions concerning specific facts of the program, most parents were in favor of the children working at their own speed, but only about half of the parents were pleased with the lack of homework in IPI.

When responding to questions concerning the effect that the program was having on the children, about half of the parents thought that their child was achieving more than in the previous year, whereas only ten percent thought that the child was achieving less. Eighty percent of the parents were satisfied with the achievement. In response to questions concerning the effects of IPI on the children's future progress, some parents expressed concern with the lack of continuity between elementary and junior high school, however most of the parents indicated that experience with IPI would have a beneficial effect on the child's attitudes toward school in future years.

The final set of questions referred to the opinions of the personnel, communication and administrative variables connected with IPI. Most of

the parents were in favor of hiring teacher aides. They were also in favor of the use of parent volunteers in the classroom, although none of the parents interviewed was a volunteer. The child's progress was reported to the parents by means of an interview. Most parents liked these regularly scheduled conferences but a few criticisms were voiced: more interviews were needed; teachers can frighten parents if the parent does not have much self confidence; because the child is not at the interview, he cannot benefit from the feedback directly.

In response to a question asking whether or not the parents saw IPI as being worth the extra cost that was required, over 80 percent of the parents answered yes. Over 50 percent of the parents said that they would be in favor of an increase in taxes for improving educational standards using programs like IPI.

IPI arithmetic was valued for the effect it had of creating enthusiasm and motivating their children so that school became more interesting or likeable. Because of this, parents felt IPI was a superior instructional method, and was an improvement over the textbook approach. Several people felt the IPI method made the child's mind more alert and resulted in the learner being able to think more clearly. The concept of mastering materials was valued because parents felt that slow, medium, and fast working children would become more skilled in arithmetic. It was felt most children were benefitting from individualization of instruction; none were being held back or being forced to catch up with the class.

In general, there were a number of conditions which made the IPI project acceptable to the respondents. In the parents' estimation, the three experimental plants were excellent schools; parental communications with the school had been adequate during the first year of the study and also during the preceding year; the parents expressed respect for the qualifications, competency, and personalities of the school personnel; they were pleased with the quality of instruction in all subjects; and the parents felt that the various methods of reporting child progress complemented one another.

There were indications from parents that the IPI arithmetic program should have some restrictions placed on its implementation. Every parent interviewed, who had a first year (grade one) student working with the IPI materials, questioned the value of the instructional method for these students.

Summary and Discussion

In attempting to tie together the results of the evaluation, one becomes concerned that the particular schools chosen for the study may not be typical of the elementary schools in Alberta. To some extent this must be true. The IPI schools were chosen because of their willingness to innovate. The bases for nominating the Control schools were: the social class of the community served, size of staff, number of students, and similarity of physical facilities. It became apparent that the Control schools also possessed many of the same forward looking philosophies as the IPI schools.

In discussing the results it must be remembered that the participating teachers became very enthusiastic about the program and it is difficult to separate the effects of the program from the effects of the teacher enthusiasm. The results may generalize to other situations where IPI is used. We report what *can* happen not what will happen.

In capsule form, six conclusions can be highlighted from the research evidence.

1. IPI students did not achieve more than the Control students. In fact, where differences did occur, they favored the Control students. The achievement measures used, CTBS Arithmetic Skills and Problem Solving Subtests, are generally accepted as being among the most useful of the standardized tests of arithmetic achievement. Since they were designed to measure fairly traditional objectives, they were considered as appropriate in the present study.

2. The IPI students had a more positive attitude towards arithmetic than the Control students. The main difference between the two programs (other than the teacher variable) is that the children proceed at their own speed in the IPI program. As a result, there may be fewer frustrations. The sequence of material is about the same, in the two programs, so that time and the ability to work to a certain extent under conditions of their own making may be the important variables for student satisfaction.

3. The IPI teachers were more positively disposed towards innovation and individualization than their colleagues in the Control group. It seems unlikely that IPI *per se* had much to do with this finding. It is more likely that two situations acting in opposite directions combined to produce the result. Participation in an innovation—particularly one as highly structured as IPI—can easily produce a positive attitude toward the project. On the other hand, being asked to act in a Control group with no short term payoff can easily have the reverse effect on the Control teachers. These two factors in combination may account for the difference between the two groups. In any event, as a result of participating in the project, the teachers seem to have developed an openness to innovation. This openness coupled with the experience with a fairly successful program suggests that a pool of teachers now exists with whom curriculum development projects might be undertaken.

4. The IPI classroom allowed for more extended student interaction with teachers than did the Control schools. Often, one of the charges made against individualized programs is that they overlook the important social component of education. The results of this evaluation suggest that the reverse might be true. Extended teacher-student interactions are those interactions in which the student is allowed to talk to the teacher for sustained periods. This being the case, the results suggest that IPI students have longer conversations on an individual basis with their teachers than Control students do. A second interesting result of the interaction analysis was that IPI teachers used fewer controlling and criticising statements than their Control counterparts.

5. Parents of children in the IPI program were favorably impressed with the program and more than half of the parents would favor an increase in taxes to support the program. It is difficult to say if the parents' behavior would be consistent with their statements, nevertheless, their acceptance for all facets of the program was impressive. Many parents noted that changes had occurred in their children's attitudes towards arithmetic, and seemed to place a good deal of importance on this observation.

6. The parents freely gave their time to help in the many clerical chores that form part of the program. It is very difficult to say how the cooperation would be over an extended period of time. Clearly, the parents saw the program as experimental. It may be that as a program such as IPI became institutionalized, the parents would expect the boards to take over the responsibilities for clerical chores.

In discussing the results and attempting to reach some overall evaluation of the project, a number of factors must be weighed against each other, and to some extent each reader must pass judgment according to his own value system. The IPI program did not produce higher achievement on measures of educational objectives that are generally valued by society. The cost of the IPI program is greater than that of the standard elementary school arithmetic program. These two factors would suggest that the IPI program does not produce compensating benefits for higher costs. But the IPI program (and the teachers) do bring about more positive attitudes towards mathematics. How does this benefit stack up to the cost? Many parents felt that the results were worth more than the cost; however, one of the truths of educational research is that enthusiasm is an unstable commodity. Will the same results persist if the program is carried-on or instituted on a wider scale? Will parents continue to volunteer their services as the program becomes common place? Will achievement in the IPI schools actually fall behind that of the Control group as teacher enthusiasm is focused on other matters? Will achievement in the IPI schools become superior as teachers and students become more familiar with individualization? These are some of the questions that must be answered before decisions for adoption are taken.

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Humanization of Learning: A Mission in Embryo

The Humanization of Learning Mission has its origin in those programs of study which emphasized the broad area of individual development and which have now become directed more specifically to the personalization of teaching and learning. A survey of various individualization programs in schools revealed that the learner was largely neglected in prominent curriculum development programs. In an effort to rectify this condition, the Mission is directed toward developing program alternatives which would accept as critical priorities for schooling the development of self-awareness, empathic understanding, and the enhancement of social responsibility. This article identifies and highlights some of the critical decision points that have had a significant impact on the development of the Mission. Particular attention is given to the demands of researchers, practitioners, and those who support such projects during the design stages.

The purpose of this paper is to examine the interconnections between the processes of research and development in education and the institution and evolution of HRRC's Humanization of Learning Mission. How one approaches this task will reflect the style and biases of the writer as he identifies the central enigma which permeates all development efforts in education. This central enigma is reflected in the selection and application of the available knowledge base and the forging of practical decisions in field developments. Two possibilities present themselves:

(1) One could attempt a systematic and logical explication of those procedures that have been identified as characterizing research and development in education and apply these procedures to the actual events that have given rise to this Mission. In the course of such application one could then appraise the appropriateness and usefulness of such procedures as they apply to a particular endeavour on the one hand while ascertaining possible oversights in the tactical management of the

Mission's evolution on the other. This would be the approach of the scholar-researcher as he attempts to articulate any area of ambiguity.

(2) Another approach would be to proceed more pragmatically and describe the evolutionary process "as it really was and is," at least, as one who has been close to this development perceives these evolutionary events.

For reasons that will hopefully become apparent, the latter approach was selected and a serious attempt has been made to highlight those encounters and confrontations, those critical points of decision and action which, in retrospect, can be seen as having impinged significantly upon the growth and development of the Humanization Mission. Finally, practical implications for the developer will be drawn.

Four questions provide a focus for the discussion:

(1) How did the Humanization Mission become launched? What events led to its founding? Perhaps more particularly, what were the grounds upon which confident judgment was attained with respect to its relevance and promise to education in Alberta?

(2) What were the significant encounters and critical decision points through which the evolution of the Mission proceeded and at which instances major developmental decisions were made?

(3) What congruities or incongruities were encountered as adjudication of the Mission's rationale and development was achieved through exposures to significant publics who are concerned about education's future?

(4) What are the sources and grounds for sustaining confidence in what is essentially a system of beliefs that is calculated to give shape to a more viable institutional response to the contemporary urgencies of man?

The Birth of a Mission

In keeping with its mandate, the Alberta Human Resources Research Council embarked upon a series of studies emphasizing the broad area of "individual development." Among these studies, one focused upon an empirical examination of the recent attempts to individualize instruction; another subjected a particular instructional system, Individually Prescribed Instruction, to systematic implementation and evaluation on the Alberta scene; and others were theoretical inquiries directed at the nature of individuality. With respect to the Baseline Study on Individualization (of instruction), it became readily apparent after a matter of months of investigation that a growing number of schools, especially in the United States, were moving aggressively into various approaches for individualizing their instructional programs (Edling, 1970). There is a considerable amount of empirical justification for the schools' attempts to individualize instruction, in that for some decades now the practising educator has struggled with, if not resolved, the problem of individual differences in the classroom. One feature, however, loomed large in this survey and that was the primarily instrumental character of these individualization efforts. Projects and programs surveyed were largely attempts at devising more effective and more powerful means by which learners

can be helped to approximate the traditional objectives of the school which continue to emphasize intellectual mastery of subject matter content and the acquisition of selected skills in communication and computation. The purposes and processes involved in evaluating the outcomes of such efforts continued to focus upon judgmental emphases rather than diagnostic concerns, which would have been more consistent with the primary purposes of individualization.

When these data and their implications were examined and thrust against the emerging needs of the prospective future, it became clearly apparent that important dimensions, particularly those involving the learner, remained largely neglected in the prominent curriculum development programs. How does the learner feel about himself as a person, what fears and struggles is he enduring, how does he attempt to work out some acceptable approximation of the school's and his own expectations—these and other such questions remain, at best, at the periphery of the individualization movement. Growing self-awareness and the judgments which the learner makes of his own competence and adequacy are not accepted by school practitioners as a point of major concern and responsibility. The learner is still compelled to persist in his aloneness in achieving some sense of functional adequacy. With rare exception, the major projects in new curriculum development and the design of instructional systems continue to evolve around new organizations of subject matter content. The Humanization Mission is based upon the recognition that additional grounds for achieving new curriculum designs must be introduced and these have to do with societal as well as individual concerns (Macdonald, J. B., 1971).

Serious doubts were therefore generated by the early studies on individualization. A critical one is the expectation that a ceiling of learner achievement is likely to be encountered when the efforts of schools do not take into account sources of inner motivation and commitment within the learner. Any curriculum design based on grounds other than the personal concerns and propensities of the learner faces eventually the problem of motivation and must contend with the necessity either to compel the learner into compliance or to elicit from him an interest in the learning task. Hence, the learner must be provided opportunities for enlarged participation in the selection and conduct of his learning engagements. In keeping with this premise, therefore, the Humanization Mission provides specifically for the ethical or moral commitment involved in the learner's "right to choose" the kind of person that it is within him to approximate.

The Humanization Mission, therefore, is, at this stage, essentially an effort to articulate and establish with defensible evidence and argumentation the critical importance of the following questions which should guide the shaping of schools' efforts to help the young:

Who am I? What kind of person do I want to become?
What do I want, need, seek? What is really important to me, to my life?
What are my unique strengths and weaknesses? How can I best manage them to achieve my goals?

How do I reach my goals? What opportunities are open to me? What obstacles do I face?

What courses of action do I choose? How do I pursue them with confidence and hope?

How do I relate to other people? When and how do I need them? When and how do they need me?

How can I gain increasing respect for myself as a person, a hopeful view of life and its meaning, and a positive feeling for others? (*Inform*, 1971)

To identify the critical shortcomings of current schooling is one thing; to enlarge upon, substantiate and effect plans and designs that promise viable alternatives represent something else again. It is in this latter area of tasks that the Humanization Mission is now critically engaged.

Period of Courtship

In the early stages of the birth of the Humanization Mission there occurred a period of what may be called intellectual courtship, covering a time when exciting ideas, promising visions, and enticing prospects for change became the object of considerable talk, both formal and informal, with like-minded professionals, researchers, and practitioners in the field. During this phase of deliberation a good deal of sympathetic encouragement was solicited from many sources and individuals. It was a time of working papers, akin to that of any act of creation, where excitement built upon excitement through a successive series of spawned ideas that were gradually committed to paper in some tangible form. Finally, a working paper in draft form emerged from this heady activity, coming as it did without too much concern (nor time) for rigor, reflective attention and responsible development. It was indeed a time of immense productivity with gay abandon. Then the "infant" was here in the form of what had come to be known as the first rationale statement for the Humanization of Learning Mission.

This statement encompassed three areas of concern:

(1) the examination of the directions in which new curriculum designs are moving and the bases upon which they are founded (they continue the traditional emphasis upon the development of cognitive functions in the learner and employ as the principal organizing theme the nature or structure of knowledge). These were assessed as inadequate in the light of the range of human urgencies and social concerns facing the individual today.

(2) a renewal of scholarly interest in the "phenomenological" study of human behavior and learning; researchers, for instance, are beginning to pay systematic attention to such notions as self-concept and the sense of "caring" as factors influencing the learning achievement of youngsters.

(3) a tentative description of select human attributes which are proposed as central to the eventual improvement of the quality of life for all. Of particular interest to the Humanization Mission was the importance of self-awareness, empathy, and social responsibility as instrumental values. Even at this stage of articulation, there emerged a growing awareness of the implicit, if not explicit, presence of value assumptions

within this statement, the lack of clarification regarding a conception of the nature of man, and the tendency to sympathize with a "humanistic" conception of learning and human development.

At this stage, only cursory attention was directed at the possibilities resident in the various social and behavioral disciplines, particularly what is known with reasonable confidence about the phenomena under examination. The assumption was that these disciplines had a considerable amount to contribute to the advancement of such a mission but the nature of their contribution was yet to be ascertained. Hence, the decision was made to subject this embryonic rationale to the critical appraisal of the community of scholars in the Social Sciences, Philosophy and Education.

Moment of "Truth"

In June of 1970 an invitational seminar was arranged at which this first statement of "beliefs" was subjected to the rigorous scrutiny and assessment by those "who know" in the basic social and behavioral disciplines. The purpose of the seminar was essentially to assess the defensibility, both theoretical and empirical, of the Mission thrust. More specifically, participants were to probe areas of critical weakness and to identify gaps in the warrantability of conceptual structures, propositions and assumptions across the wide range of relevant phenomena. They were also asked to assess the developmental prospects of the Mission and to assist in proposing criteria for judging its pedagogical and economic possibilities. Finally, the participants were encouraged to give expression to their own personal visions of the possible and in this way help to chart some promising developmental directions. Prior to the seminar itself, selected resource specialists were asked to prepare a short statement in which they gave expression to their own criticisms and assessments of the Mission plan.

This series of confrontations, both written and oral, was to reveal: (1) the existence of a considerable repertoire of useful and relevant understandings and insights that would help substantially in amplifying and clarifying the particular concepts and propositions subsumed by the Mission statement, and (2) dramatic evidence of the shortcomings within this repertoire in helping to chart reliable directions, choices and programs of action in the practical field of education. The latter merely confirms what, since that time, has been identified as the inappropriate use of research in pursuit of warrantable conclusions and generalizations to inform practical decisions and actions in specific human contexts (Schwab, 1969; Cronbach and Suppes, 1969).

A summary of outcomes and effects of this series of encounters with the scholar-researcher has high relevance at the point of linking whatever is known to any developmental task or program in education. First, as befitting the scholar-researcher, the resource specialists were particularly astute and incisive in their critical analyses of the Mission statement. They were as a group, however, reluctant or unable to suggest productive ways in which problems could be solved—problems involving conceptual clarification, the warrantability or usefulness of

particular assumptions and propositions, and the strategies of moving such a design into more operational phases. Again, one appreciates the difficulty of such an assignment in view of the inappropriateness of the methods and modes of theory construction and empirical investigation in the basic disciplines to the task of forging defensible decisions in practical field settings.

Nevertheless, a number of critical assists were obtained. The Humanization Mission, at the outset, was challenged on the grounds that its value premises were not clearly indicated. What values or value systems guided the thinking of the project staff; what assumptions were being made in setting priorities concerning human attributes of rationality, empiricity and the like; and what further normative and descriptive assumptions were being made in the prospective selection of intervention strategies through instructional procedures? On this question of value assumptions permeating the Humanization Mission, two alternatives presented themselves. One suggested a treatment that moved to ultimate purposes of life and the values of truth, goodness, justice and freedom. Or one could propose the introduction of a concept such as "survival," not as a normative designation but as an empirical construction, much in the way that Scriven (1966) argues its treatment. The urge to survive is reflected in the behavior of all men in all contemporary circumstances.

The Humanization Mission then established the grounds for its selection of priorities by focusing upon the enigmas facing current man at a time when prospective futures, given present trends, lead predictably to his progressive deterioration—biologically, socially and psychologically. Given this point of departure, the argument then urges that schools must focus upon human problems and crises which impinge upon the person of the learner as he struggles to maintain some degree of functionality in handling the stresses and strains of living in some adequate way. It is not that each person will not have to demonstrate the highest level of intellectual competence in the course of his struggles. The Mission merely asserts that, in addition to such competence, each learner must be assisted, with equal promise, in cultivating high levels of compassion for others and a commitment to the enhancement of well-being of all in a mutually interdependent world. Hence, the focus is upon self-awareness, empathic understanding and the assumption of social responsibility as critical priorities for schooling in this latter half of the twentieth century.

A second critical concern was a repeated query as to the conception of man held or implied within the Mission rationale. Here too, the task reflects itself in an apparent necessity to consider two such conceptions, the behavioral and the phenomenological (Hitt, 1971). Still, while the stipulated emphases in behavioral outcomes tend to represent a sympathetic relationship to the phenomenological approach to the study of man, it would be premature and, in all likelihood, imprudent to set forth such a definitive choice and attempt to remain consistent in its applications. Earlier debate about the nature of man led to such judgments as man is rational; man is irrational. Man is good; man is evil. Man is shaped by culture or by his inherent nature; man shapes himself by the exercise of "free will". And so on. The tentative "resolution" of this

dilemma is reflected in the acknowledgement that man is none of these and all of these at the same time. For the moment, a conception that man is *malleable* can be reasonably grounded in the recent cultural anthropological studies of human nature and its evolution.

A third issue involved the selection of a particular "source" for a curriculum design implicitly indicated by the present Humanization statement. Is the prospective curriculum design premised upon the central place of knowledge or the disciplines (the current point of departure in most modern curriculum developments on the North American continent), the demands of society or the needs and problems of the learner? Once more, any curriculum design in fulfillment of the Humanization idea will of necessity have to contend with all three such sources of curriculum construction. It can be said with some confidence, however, that serious weakness has been acknowledged in the exclusive use of the structure of the disciplines as an organizing principle, particularly as the needs, aspirations and propensities of the learner as an evolving human being are not taken into significant account. Indeed, it is assumed that enquiry into problems of the discipline will eventuate in the exciting engagement of the learner as an enquirer much the same way that scholars and research scientists are fascinated and intrigued by the anomalies of their own subject matter. Even Bruner (1971) has recently acknowledged the questionable character of this premise.

The significance of this encounter with the disciplines for the would-be developer is a critical one. Admittedly, it is assumed that any developmental effort, if it has any prospects for successful intervention, will have to draw upon what is confidently known in that body of relevant and reliable knowledge. The difficulty, of course, occurs in the attempt to select and apply such knowledge to advance the purposes of development. This difficulty originates from the fact that the different social and behavioral disciplines have their own systems for charting the study of human phenomena. Schwab (1960; 1964; 1969) has begun to examine this enigma in a systematic appraisal of the different forms of enquiry and the demands for practical decision-making. It should be apparent to all educational researchers and developers that different disciplines take different "slices" of the human phenomena which are subjected to scrutiny and study. Not only do they select their data for systematic examination, they also tend to order the constituents in different taxonomies or classification systems. As Schwab points out, each one selects some distinguishable set of phenomena while leaving others ignored. The challenge to the developer, however, is to establish viable negotiations with the actual flow of real events in particular settings. Such settings present him with an enormous array of ascertainable "units" functioning in a wholistic configuration of interlacing, interacting and interdependent linkages. Hence, he is driven to make whatever pragmatic use is indicated of, say, the systems of classification or taxonomic schemes, knowing at the same time that such schemes offer him limited power to comprehend and manipulate the entire range of relevant events.

One of the consequences of descriptive classifications is the apparent necessity to continue to make such distinctions as "cognitive" and "af-

fective" even though serious criticism is directed to such use in a developmental setting. Still, one can only argue that an enormous amount of respectable research and development effort has been predicated upon this very distinction of educational objectives in much educational research (Bloom et al., 1956; Kratwohl et al., 1964). This difficulty is compounded further when recognition is made of the extended dichotomies in the study of human behavior throughout the history of psychology when reason was juxtaposed against emotion, thought against feeling, and mind against body. Either the developer struggles to resolve or reconcile such explicit distinctions in the interests of approaching reality with more viable tactics, or he lives with such a distinction, distasteful though it may be, while moving with caution into more specific instrumental designs. The danger, however, is that such conceptual structures based upon units of observation and description lead also to a pragmatic separation and compartmentalization of thought. Such a prospect is especially troublesome to the Humanization Mission, inasmuch as its central necessity is to synthesize and integrate efforts at schooling in response to social need and human urgency. In the meantime, the challenge of forging more overarching structures in the study of human behavior must be returned to the theoretician and researcher in the social and behavioral disciplines. The developer, on the other hand, is encouraged to pursue, albeit in a "messy" way, a kind of responsible eclecticism which involves bringing to bear to the point of action anything that is known with confidence in whatever relevant discipline. Macdonald (1966) expresses added sympathy for the participant in an "interdisciplinary noman's land" when he suggests that

. . . the only unity is imposed by the organizational demands of universities and faculties or schools of Education, or by the carefully planned and large-scale educational research which some of us hope will eventually be undertaken, as apart from simply being talked about. . . . If educationists wish to hasten the process, they can do a great deal by entering the empirical world and helping to foster the conditions which make possible this limping but inevitable development of education as an academic study (p. 237).

Caught In The Crossfire

Any developmental effort such as the Humanization Mission has to contend with at least three levels of adjudication: researchers in education and the human sciences; practitioners in the schools and in related service agencies; and members of Government who must eventually grant or deny support. A few pointed examples should serve to illustrate the way in which these adjudication processes give rise to persistent, sometimes non-reconcilable demands. The theme of "survival" was chosen as the basic organizing principle around which to establish the relevance of a set of human attributes. This was challenged by some academicians as representing a serious compromise of the inspiring "dream" of humanization. It was, in effect, a dilution of something of much greater worth and significance and the interjection of a ceiling for man's aspiration toward the "good life".

Similarly, the selection of the name of the mission, Humanization of Learning, was criticized by school practitioners as implying that present schooling experiences are proving to be de-humanizing. Research analysts, in turn, condemned this and other comparable phrases as "sloganeering". Such criticisms, while they may have some justification, do not allow for a growing trend toward more involvement of non-professional publics, including parents and learners, in the designing of future educational programs. This is not to be construed as reason for tolerating conceptual ambiguity, indefensible generalization and questionable logic of argumentation. It simply means that the academician who engages himself in serious development work must quickly learn to communicate with a variety of publics. In this regard, he will have to cultivate skill in dealing with the demands of the practical world while preserving his commitment to responsible scholarship. The niceties of extensive qualification, for instance, may be viewed as the work of a penetrating and precise intellect in scholarly discourse but would elicit judgments of indecisiveness and weak commitment among decision-makers in the world of practice.

Another point of debate concerned the ultimate goal of the Humanization Mission. In the early period of preliminary articulation there was no suggestion that the purpose would be the development of a significantly different model of schooling which would eventually be imposed on *all* Alberta schools. Shortly thereafter, however, a decision was made to view this development effort as leading toward an *alternative* model significantly different with respect to ends and means from present schooling practices. This decision similarly was construed by some as reflecting loss of courage and commitment to a proposal for radical reform of existing schools (Gross, 1971). Radical reforms, in contrast to innovations of the experimental variety typifying efforts at school improvement today, have even suggested going beyond existing schools and have proposed reconstructions that amounted to de-schooling. Whether the commitment to the development of an alternative model of schooling is seen as a retreat from what some hoped would develop into a radical attack on existing schools is something for future students of the social and educational scene to judge. One is inclined to argue in any case that a proposal for shifting the locus of choice as to purposes and procedures increasingly toward the learner, as he avails himself of opportunities to grow, is in the present context of school thought and practice a departure of significant proportions.

There is another point at which development staff will find itself attempting to reconcile inconsistent demands. Academic researchers as a group tend to manifest a thorough and reflective attitude to the systematic production of knowledge in keeping with their concern for intellectual rigor and defensible inquiry. People responsible for the conduct of practical affairs, however, confront problems of increasing complexity that demand prompt attention and resolution. Hence, there will be a growing and insidious expectation of instant results on the one hand and the ponderous task of securing, applying and testing knowledge in a particular arena of practice on the other. One thing is assured, and that is that the demands for visible products will come early and persistently.

One way in which the early stage of articulation of the Mission proposal was affected by these apparently inconsistent requirements occurred at the time that the invitational seminar was scheduled. The time chosen for this seminar was June, 1970, and its purpose was essentially to subject the Mission proposal to critical scrutiny and appraisal by the research community. It was generally agreed that this first statement would have benefited considerably by further clarification and refinement of the essential themes. However, it was also clear that, unless some basis for the rigorous analysis and appraisal by "those who know" was established before the fall of that year, budgetary decisions were so scheduled as to preclude any possibility for support during the succeeding year to further articulation and refinement of the Mission rationale. One does not need to remind researchers how often they are faced with the necessity to request and justify support for the next year's research effort before the current year's activities have brought forth sufficient evidence to merit continued support. Clearly, the researcher, committed as he is to the tenets of responsible inquiry, comes into stark conflict with the fiscal necessities which require appraisals of productive potential long before his research effort has had any opportunity to show what it can do.

With respect to the adjudication processes on these three levels, the Humanization Mission effort encountered an interesting phenomenon that might be termed vetting by circular legitimation. To recall again the early history of the Humanization Mission, considerable risks were encountered when only a rudimentary description of contemporary trends in curriculum change, shifts in research emphases in the social sciences and the implications for educational priorities was effected in the first "prospectus". Time and resources were simply inadequate to give shape to a more substantiated document. Nevertheless, an advisory group of professional educators extended initial encouragement and support for the humanization ideal. However, before the proposal could be vetted by responsible authorities in the Human Resources Research Council, it was to have been subjected to informed appraisal by research specialists in the relevant human disciplines. Support for the advancement of the Mission would clearly be contingent upon successful adjudication at this level. As it was, a less than adequate statement than could have been produced had to carry the burden of surviving critical analysis and judgment by scholar-researchers, which, in turn, became the important base for a decision by Council to grant or withhold support for the *further* articulation and refinement of the Mission rationale. A more thoroughly researched and polished statement of intent and justification would likely have fared better in this round of critical appraisal. Under such circumstances, vetting authorities must draw further confidence from the assessed capability and commitment of individuals whose task it would be to move a plan of high risk into subsequent stages of productive development.

The Critical Play of Confidence

Perhaps the most significant phase of productive effort occurred after the June seminar. A series of questions and problems were framed and categorized according to different theme areas and a group of select

specialists from the various disciplines were invited to address themselves to these concerns. These questions or problems represented areas of ambiguity and matters of tactic and procedure for field application. A group of thirteen resource consultants in Sociology, Social Psychology, Educational Psychology, and Curriculum were invited to examine research and theory relevant to these questions and to speculate freely and courageously about fruitful solutions or responses. Important here is the clear and precise identification of relevant questions and tasks and subsuming them into categories amenable to reflective response by research specialists. Also, it is critical at this stage to invite the "right" kind of resource specialist for such an engagement, individuals who express strong sympathy and fascination for the humanization effort, who are highly respected scholars in their own right, and who hold a pressing concern for the realities of current schooling and the need to foster significant changes in them. Consideration should also be given to the danger of acquiring a resource consultant with such awesome status or persuasive power that his own point of view might bend the subsequent charting of conceptual and developmental activities to unwarranted degrees. The need, essentially, is to obtain the best that is known in the way of more definitive and focused input, and it is the responsibility of project staff to assure that the relevant perspectives, both theoretical and empirical, are brought to bear upon the particular questions or issues then in view.

Another source of psychic support emerged in the form of three reports from the task forces mounted by the Commission on Educational Planning in Alberta (1971a; 1971b; 1971c). It was noteworthy to find that essentially humanistic concerns for the person of the learner and the need to enlarge his capabilities for self-direction and self-renewal loomed large throughout these reports. There is, however, a danger that new ideas and proposals may acquire authentication through what might be called cyclical acknowledgement. It has become evident within the past few months that a given spokesman would cite person X as an authority for a statement about the humanization of the educative process and some months later person X would cite the first spokesman as *his* authority for the same point. This kind of reciprocating authentication may appear as a result of efforts to legitimize a new proposal or program.

Within the past few years a number of converging, yet discreet but highly interrelated developments have appeared in schools on this continent. All of these impinge at various points upon the basic themes of the Humanization Mission. The "free" schools movement on this continent is generally sympathetic with the essential tenets of Humanization. A fascinating exemplar is found in the Campbell River Secondary High School on Vancouver Island which had introduced a seemingly innocuous innovation by providing students the option to attend or not to attend classes. All other requirements are characteristic of the traditional, centrally guided if not directed, school system. Nevertheless, highly significant influences and alterations have become apparent in the behavior and attitude of professionals and learners alike within the school. Such expanded learner choice and the exercise of responsible decisioning are clearly indigenous to one of the central themes of Humanization. In addition, some exciting

work is being done in the area of values and their treatment in Social Studies curricula (Alberta Department of Education, 1970), the injection of feeling and fantasy into learning activities (Jones, 1968), the calculated emphasis on the "here and now" (Alschuler, 1970), a concern for improved human relations in the classroom (Lopatka, Henders, and Con, 1970), and the pedagogical application of achievement motivation training in education (Evans, 1971). One school innovation in Alberta of fairly substantial proportions has been grounded also upon humanization themes and serves, additionally, to reinforce the practical prospects of the Humanization Mission (Bliss, 1970).

To be sure, it is no handicap to an endeavour such as the Humanization Mission when a highly renowned and respected psychologist such as Bruner (1971) expresses some serious personal reservations about his previous commitment to the "structure of knowledge" as a principal basis for new curriculum developments. He now allows that such important influences as social class and inner personal struggle need to be represented prominently in any reconstitution of schooling practices. Even more surprising is his recognition of the importance of the "here and now".

What is important is to learn to bring all one's resources to bear on something that matters to you now. These are the times for the migratory questions that wander on long after their answers are forgotten, just because they are great questions. And there must be more time for the expressive elements — the encounters, the hates, the loves, the feelings. All this need not be antic nor need it all be in the manner of presenting one's case (p. 20).

In his own words, Bruner reveals how much he has moved in the direction of the humanization ideal:

I believe I would be quite satisfied to declare, if not a moratorium, then something of a de-emphasis on matters that have to do with the structure of history, the structure of physics, the nature of mathematical consistency, and deal with it rather in the context of the problems that we face. . . . We might put vocation and intention back into the process of education, much more firmly than we had it there before (Italics in original) (p. 21).

Indirectly, Bruner is implying that the initiative to learn and the desire to learn, if they will eventually be translated into energetic thrusts on the part of the person, must be ignited through more personalized concerns involving the learner's immediate and ultimate goals.

The Humanization Mission is essentially a curriculum development effort which is opting for an alternative set of educational priorities and processes to enhance and vitalize continued learning encounters. As such, it must draw upon whatever is confidently known in related disciplines and specialties. Its processes must, of necessity, be "eclectic", in the sense that it must employ "arts by which a usable focus on a common body of problems is effected among theories which lack theoretical connection" (Schwab, 1971, p. 10). Schwab postulates further:

There is no foreseeable hope of a unified theory in the immediate or middle future, nor of a metatheory which will tell us how to put those subjects together or order them in a fixed hierarchy of importance to the problems

of curriculum. What remains as a viable alternative is the unsystematic, uneasy, pragmatic, and uncertain unions and connections which can be effected in an eclectic (1969, p. 10).

The "Arts of the Eclectic" are just now receiving systematic attention and early indications suggest that the role of the developer will be a highly demanding one both in forging the necessary linkages among the various theoretical inputs as well as in devising effective strategies of intervention (Schwab, 1971). In the meantime, the generalist in education who seeks to initiate a developmental program such as the Humanization Mission finds himself in a delicate game of professional brinkmanship wending along a precariously thin line that separates persuasive exhortation from warrantable advocacy.

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Social Science and Social Progress, 1971: An Assessment and a Prognosis

The critical examination to which research and development activities and agencies are being subjected is taken as a point of departure for reviewing historical developments and persistent problems in both approaches and institutions. Two general types of problems encountered by research agencies are identified as capability problems and credibility problems. Persistent capability problems reside in the inadequacies of knowledge bases, of conceptions of the research and development process, of policy research, and of auditing devices. Credibility problems relate to the difficulty of establishing and maintaining effective relationships with scholars, policy-makers, client institutions, and the subjects of social research. It is suggested that among the needed developments for the future are better techniques for mobilizing, utilizing, and controlling the resources of social policy research.

The lavishly-funded movement in research and development in education and other social services which began in the United States in the mid-fifties, gained momentum and spread to Canada in the 'sixties, appears now, in the early 'seventies, to be in serious jeopardy. The movement, it is claimed, simply has not lived up to its promise. Education and other institutions of society have not been reformed and revitalized as expected.

Not surprisingly, this year, the budgets of most R and D agencies have been reduced. The movement has come under critical re-examination. And R and D has been asked to demonstrate (as research has seldom, if ever before been required to demonstrate) that its benefits to society warrant its costs to the taxpayer.

Easy explanations of this unfulfilled promise have come from various sources. Some observers claim that the potential of the social sciences as instruments of social improvement were grossly overestimated in the first place. After all, these fields of knowledge were and still are comparatively young; to expect them to generate sufficient knowledge to

solve the problems of a complex society was to set an unrealistic expectation. Others contend that the linkages required to make research and policy or research and practice complementary to each other have not yet been established and are not likely to be. After all, the world of the practitioner and politician is essentially an intuitive, non-scientific world; to expect such action-oriented persons to become the bedfellows of theory-oriented social scientists was again to set an unrealistic expectation. Still others argue that the movement has not yet been given sufficient time to prove itself. It took more than a few years of research and development to build the atomic bomb or to send a man to the moon; surely the problems of ignorance, poverty, urban decay and the like are just as difficult and time demanding. And so the process of rationalization goes on.

But after all of these easy and perhaps partially accurate explanations have been heard, the difficult questions remain: What, if anything, has gone wrong? Were there false expectations? Or miscalculations? Can the social sciences really contribute significantly to social progress? How?

R and D in Historical Perspective

The origins of the R and D movement on North America can be traced to the *project research* in the fields of agriculture, medicine, defense and to some extent, education which received increased support from foundations and governments in the early 'fifties. Most of these projects were conducted by individuals or small groups who were encouraged, through grants, to attack problems of their own choosing. This research effort was largely curiosity-inspired. Hence, it tended to be fragmented and non-cumulative; it was frequently seen as irrelevant by policy-makers and practitioners; and it tended to widen the gap which already existed between the discovery of knowledge and the use of knowledge.

So in the 'sixties a *systems view* and a *mission approach* came into vogue. Under this approach, research was to become cumulative, programmatic, and problem—or development—inspired. More important, it was to get linked in an operational way with invention, with testing, and with the installation of the new policies and practices which it spawned.

Quickly it became apparent that no existing institution was geared to this mode of operation. So governments moved to create new institutions. The United States government established a number of R and D Centres as adjuncts to existing Universities and a number of Regional Laboratories to plan, manage, and mobilize resources for a major R and D venture in education. In addition, support was increased for the several *policy research institutes* that were concerned with relating social research to the process of social policy development.

Some Canadian provinces followed this lead—at least in a token fashion. Ontario set the pace with the establishment of the Ontario Institute for Studies in Education. Alberta followed with a more broadly mandated institution—the Human Resources Research Council. Others

established centres more or less apart from government and more or less affiliated with Universities.

A number of important assumptions underlay these developments: first, that the effective conduct of R and D ventures would require a host of complementary talents—academics of many disciplines, developers, field testers, policy-makers, and practitioners; second, that operational linkages would have to be established among the various agencies—universities, educational systems, departments of education, teachers' associations, and so on; and finally, that a new agency would be required to perform the new role of research planning and management, of mobilizing resources, of maintaining inter-institutional linkages—in short, of mission planning and control.

Some of these agencies have now been in existence a decade or more. Others are of more recent origin. All of them, along with the idea that led to their creation, are now under review. What difficulties have they encountered? How and how well have they coped with these difficulties? How might they be strengthened? What is their future?

Persistent Problems in R and D

The problems that are typically encountered by any new R and D or policy research agency are of two general types: problems that have to do with its *capability*—its command of the knowledge, tools, techniques, and strategies which are involved in its operations; and problems that have to do with its *credibility*—the position of esteem or otherwise which it holds in the eyes of those whose cooperation it requires to get on with its job.

Of course these two types of problems are closely related. Indeed, one can often be the cause of the other. Any research agency that fails to develop a capability is likely to have difficulty maintaining credibility with its clients. Similarly, any research agency that lacks credibility is likely to have difficulty mobilizing a capability.

Nevertheless, it may make sense to examine certain persistent problems in the context of this general distinction.

Capability Problems

1. Inadequate Bases of Knowledge

The store of knowledge upon which R and D in the social domain has attempted to build, has proven inadequate in two major respects. First, it has proven to be so fragmented that general theorems and broad conceptual systems (necessary starting points for R and D) have not been forthcoming. Second, since the knowledge that has been generated in the social sciences has been so largely of the descriptive and normative variety, R and D has lacked the "operational knowledge" required to move from questions of "what is" and "what ought to be" to question of "how to do what ought to be done."

The *fragmentation* that characterizes knowledge in the social domain can be explained partially by the attitudes that social scientists have adopted with respect to theory-building and by the kind of empiricism

that has characterized most social research. Social scientists tend to reject grand theories; they prefer to work with mini-theories, no theories, or so-called "theories of the middle range." Seldom do their theories transcend the boundaries of a single discipline in such a way as to interrelate the perspectives and principles of several disciplines—even when these theories involve common phenomena. Their methods and the data they generate are correspondingly fragmented and difficult to put together into the kind of a base-line of knowledge which is required for the initiation of systematic programs of R and D.

What is needed to correct this situation are general theories or conceptions of social systems—conceptions which inter-relate all the social science disciplines and make it possible to connect knowledge generated by one field with knowledge generated by others. Before this need will be met senior social scientists must dare to venture beyond the boundaries of their own disciplines (as some are beginning to do) and seek to establish systems for relating their knowledge and insights to those of other scholars. Such "generalists" in the social sciences could serve R and D missions by providing the codifications of knowledge which would become the baselines upon which mission planners might build.

The scientist's typical disregard for *operational knowledge* is somewhat over-stated by the story of one "expert" who, when asked for his advice as to how to cope with the U-Boat menace in the Atlantic during the World War, glibly advised:

"Boil the Atlantic."

When asked how one might accomplish this remarkable feat, he replied:

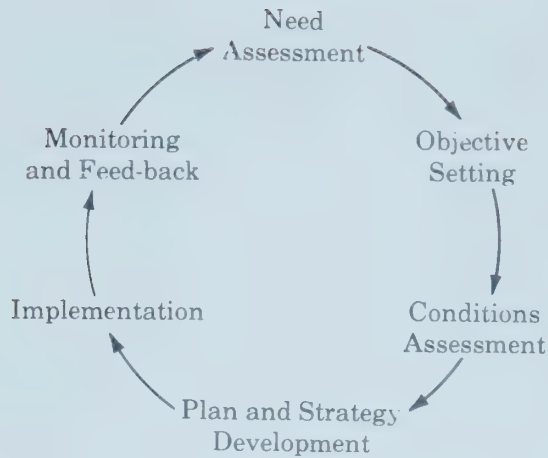
"*How to do it* is not my business. That is the problem for the engineers and administrators."

Recent studies of the processes of change have begun to shed some light on operational questions. But in much of the R and D work currently underway, the change and implementation aspects of the process are typically turned over to practitioners and not properly studied by scientists. Granted, practitioners do, through experience, develop intuition, instincts for what will work and what will not in the innovative process. But through these techniques, knowledge does not accumulate. Each innovator proceeds "to re-invent the wheel."

2. Inadequate Conceptions of the R and D Process

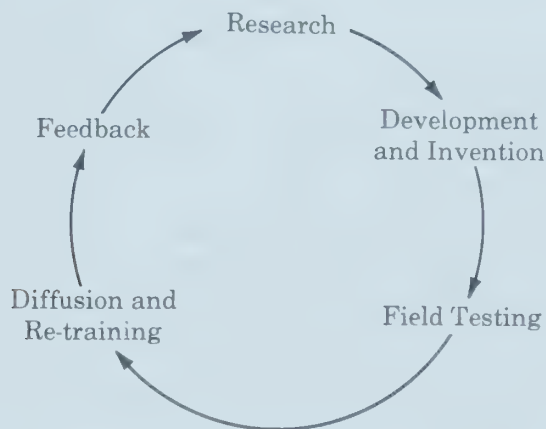
Conceptions of the R and D process have been of two general types. One of these, the one typically espoused by social animators, rests on an assumption that there is, within society and its various institutions, sufficient knowledge and expertise to support a continuous process of self-renewal—if only this knowledge and expertise could be activated and directed toward proper ends. Grass-rootism, self-analysis, and the staff project are the preferred methods of innovators who adopt this model.

Models of the R and D process, resting on this assumption, take a form such as the following:



At the other extreme is a conception, the one typically adopted by researchers and bureaucrats alike, which rests in the assumption that change is anathema to individuals and institutions and, hence, that the application of new knowledge to practice must be contrived or engineered by an outside agency.

Models resting upon this assumption take quite a different form:



There are marked differences between these two conceptions. In the latter, the assumption is that something is to be done *to* the client system; in the former, the assumption is that the client system is to do something *for* itself. In the latter, there is a hint of manipulation of a less knowledgeable agency by a more knowledgeable one; in the former there is a suggestion that knowledge and expertise can be sacrificed, if need be, in the interests of participation and involvement.

Clearly, neither of these models is adequate to guide a scientifically based, systematic and sustained program of R and D. What is needed is a combination of these and other concepts into a comprehensive conceptual framework of the process. What is further needed is empirical testing of the model to provide the “operational knowledge” referred to earlier.

3. Inadequate Conceptions of Policy Research

It is generally assumed that research can and should provide the basis for both “incremental” and “reconstructive” change in the institu-

tions of society. Incremental change is usually thought to be the likely outcome of the process of R and D. Normally, it proceeds on the assumption that the institution (the school, the college, or whatever) is a "given"; the goal is to effect change *within* the existing institutional context.

Reconstructive change is usually thought to be a more likely outcome of policy research. Unlike R and D, policy research proceeds on the assumption that existing institutions and programs are not "givens." It aims somewhat higher—at policies rather than the programs or institutions through which policies are implemented. Recommendations for reconstructive change are the expected outcomes of such studies.

Current conceptions of policy research—along with the methodologies adopted by those who conduct it—are singularly primitive and unreliable. Most so-called policy studies simply do not contribute greatly to the development of social policy, for their recommendations are seldom heeded. And when they are, the consequences are as often disastrous as they are helpful.

Why? What are the major shortcomings of contemporary policy research?

First, in much of what sells as policy research, there is little or no relationship between the empirical data (with which all policy researchers begin) and the evaluative statements and recommendations (with which they all conclude). This seems to suggest that policy research has a kind of seductive quality, probably having to do with its proximity to power, which encourages researchers to go beyond their knowledge and make recommendations which come strictly "off the top of the head."

Second, most policy researchers tend to deal in single prescriptions rather than alternatives. They tend to recommend rather than hold out possibilities. In any given case, the recommendation may be formulated primarily on economic grounds, or social grounds, or educational grounds, or the value preferences of the researcher, or whatever. But when the policy-maker comes to deal with the recommendation, some other consideration may be of primary concern to him. So he may have no alternative but to reject the recommendation. In short, too many researchers leave room for the policy-maker to maneuver and exercise his own judgment.

Finally, policy researchers have not yet learned how to specify the likely impacts of various alternatives—how to provide the policy-maker with material to consider as he weighs the pros and cons of the possibilities identified. What is needed, of course, are techniques for simulating various conditions, conditions which correspond with the various alternatives, and for assembling data in such a way as to clarify the consequences, intended and unintended, of various choices.

4. Inadequate Auditing Devices

The tools that the social sciences have developed for monitoring social change and for assessing the impacts of planned interventions are quite unequal to the needs of R and D agencies. Social scientists have typically sought to experiment in controlled situations, in which the object

is to observe and describe the relationship of one variable to another. In R and D, situations are not controlled. Concern must be for a total system—not a single pair of variables.

What is needed for the effective monitoring of R and D programs is a monitoring and evaluation scheme based upon a systematic view of all of the phenomena and all of the activities involved in the mission. Given such a view, it should be possible, in time, to develop comprehensive monitoring instruments for taking stock of states-of-affairs at various points in time. Some of the more recent attempts at social accounting and institutional stock-taking appear to have promise. But a good deal of refinement and instrument development will be required before they begin to meet the need.

Credibility Problems

As serious as and closely related to the problems of building research and development capabilities, is the R and D agency's difficulty of establishing and maintaining credibility with the variety of institutions and individuals with whom it must collaborate—the university scholar, the policy-maker, the client institution, and the subjects of research.

1. Credibility Between the Developer and the Research Scholar

One of the most popular and powerful concepts to emerge over the past few decades has been the concept of "mission-oriented research." The mission approach to research planning and management has been credited, for example, with the successes of the American space program in sending men safely to the moon and returning them to earth. So it has been assumed that such an approach could be used to enhance the effectiveness of any problem or policy-oriented research agency. But there are difficulties in the approach.

In the planning of mission research, one sets a goal or a target (landing on the moon) and then very carefully plans all the activities (filling gaps in knowledge, inventing needed instruments or technologies, developing required materials, training specialized personnel, and so on) required to achieve the goal in a minimum of time, with minimum chance of error, and with a minimum expenditure of resources.

The important thing is that each activity in the program must be incorporated as a part of a master-plan—each activity as a consequent of an earlier activity and the antecedent to a subsequent activity. Hence there must be some kind of mission control, some mechanism for ensuring that all activities are appropriately designed, carefully scheduled, and integrated into the master-plan.

And that is the source of difficulty. To ensure that each activity or project is effectively conducted, the organization must attempt to attract to the project the most expert talent available. Such talent is typically found in scholars who have developed their expertise in the university setting and who have adopted the university's posture with respect to research: creative, theory-based inquiry in an environment of complete academic freedom.

Many scholars are inexperienced in mission research. They are suspicious of the term. The concept is anathema. So the dilemma emerges: how can the individual scholar be allowed to follow his own creative instincts or the emerging theoretical underpinnings of his field when the goal of the organization is to resolve a specific set of problems, to achieve a specific mission?

First, the planners of research missions and the prospective doers of research cannot be expected or allowed to work independently of each other. Only when there is a satisfactory merger of the two specialized talents can it be ensured that missions will be properly designed and that specific activities will be properly conducted.

Second, it should not be assumed that mission research planning or management is always anathema to all scholars. On the contrary, when the orientation is judiciously imposed and its benefits expertly demonstrated, it has a good deal of appeal to some academics—particularly to the confident, seasoned scholar who “knows damn well” that he is academically free, but feels little compulsion to reassert the point; and to the so-called “new breed” of social scientist who is interested in contributing, not only to the literature of his field of study, but also to the improvement of the society that he studies.

2. Credibility with Policy-Makers

When governments create and sponsor research agencies, they tend, logically enough, to regard such agencies as their servants. They like to think of the agency as the problem-solving, research arm of the government. Hence, they expect it to be sensitive to government's needs, to solve government's immediate problems, and to concern itself with whatever things concern the government.

This view is quite understandable. Politicians tend to live day-to-day existences. They realize that unless today's problems are satisfactorily resolved there may be no tomorrow. Hence, their concerns tend to be with the immediate rather than the long-range. It is also a fact that problems are frequently defined by policy-makers in rather narrow terms; sometimes it is the symptom rather than real issue that is identified; and as often as not, the problem is framed by policy-makers in terms that make it unmanageable to researchers. Finally, the politician's priorities are not likely to be the same as those of the research agency. The first concern of the politician is, and must be, to stay in office; the goal of the research agency is to inquire into the nature and causes of society's problems. With two such different perspectives, the politician and the researcher are likely to disagree from time to time on what is important and what is unimportant.

But there is another side to this issue. Many politicians do, in fact, develop a high level of insight into social conditions; the instincts of many politicians are very good indeed. The views of such insightful, intuitive policy-makers can be most useful to the research agency as it shapes its goals and programs.

In addition the research agency's very existence and the support it receives depends, in the final analysis, upon its capacity to resolve prob-

lems, to inform the process of social policy development and, hence, to have real relevance to policy-makers. So, if the research agency persists in taking on problems that are not seen as problems by policy-makers or in recommending policy changes where policy changes are not being contemplated, then the agency will become known for the irrelevance of its work. And it will find itself out of favor with those whose support it requires for its existence.

In light of these considerations, research agencies, if they wish to maintain credibility, are well advised to engage in three major types of research—defined in terms of their proximity to the process of social policy development:

First, independent research projects which are initiated, designed and conducted without any collaboration with or approval from another agency. They may be evaluative, descriptive, or experimental. They may be theory-based or problem-inspired. They may be calculated to add new insights to an issue of continuing public concern or to jolt the public conscience with an exposé of an undesirable condition and alternative strategies for its correction. In any case, such projects establish the research agency as one which is, in part, autonomous and self-directed, quite capable of setting a major portion of its own mandate and of living with the consequences of its actions.

Second, jointly planned research and development missions, the impetus for which may come either from the research agency or from a prospective client group. In either case they are designed in close communication with those agencies whose cooperation is required for the successful conduct of the project. Such projects identify the research unit as an agency which works shoulder-to-shoulder with policy-makers, planners, and practitioners for the improvement of policy and practice.

Third, requested studies, which are usually evaluative or planning studies of the so-called “quick and dirty” variety. They are initiated at the request of a client agency. Such studies establish the research agency, in part, as a stand-by evaluation and research capability for policy-makers and practitioners.

3. Credibility with Client Institutions

The major cause of the credibility gap with client institutions is a fundamental difference between the inclinations of the researcher, on the one hand, and the practitioner, on the other. The researcher is inclined to search for certainty—to know what he knows for sure; the practitioner is inclined to act on the basis of the best knowledge available—supplemented by his intuition and judgment, acquired through experience. Hence, there is frequently a natural suspicion of each other, not conducive to effective collaboration.

Closely related is a second difficulty having to do with the basic differences between the process of institutional change and the discovery of knowledge. Institutional change is a continuous process; it is characterized by incremental modifications in procedures and by the gradual adjustment of affected persons to such change. The discovery of knowledge, in contrast, tends to occur in spurts; findings simply become

available as studies are completed. The abrupt, unanticipated jolts that new research findings can sometimes give to the management process become dysfunctional. The manager's inclination is to move deliberately and gradually to integrate the new knowledge into evolving practice; the researcher, however, eager to have his contributions recognized, may be inclined to attempt an "end run", to short-circuit the process by moving his inputs closer and closer to the top of the policy-making hierarchy. When this maneuver fails, as it usually does, the researcher, the practitioner, and the policy-maker have further cause to distrust one another.

Still another difficulty in research and development endeavors in this country is what OECD observers have referred to as the "ecological difficulties of development." The reference here is to a void, a condition of inaction and non-support for the activities that are required to link policy to research, action to knowledge.

This observation has substance. Very few social service delivery systems in this country make any kind of provision for development activities—inventing new methods or testing innovations. Few private enterprises have chosen to gear their operations to the commercial development of the instruments of change in social services. And few universities or other research agencies move beyond pure and applied research to the development of the tools and materials of implementation. In short, development capital has been in very short supply.

Given this state of affairs, the new research and development agency may see no alternative but to attempt to carry all aspects of the research and development itself—to conduct the required research, to invent the instruments of implementation, to retain practitioners, and to develop the required materials. But when this course is followed, all sorts of problems are generated: (1) total responsibility for the conduct and the cost of the activity rests with the research and development agency—an awesome burden and a hazardous commitment; (2) the client organization tends to become passive and dependent—to adopt a "change me if you can" attitude; and (3) the research and development agency tends to be viewed as something of a "pork barrel" by client agencies—all manner of fringe benefits may be exacted as the price of collaboration.

In such cases, the R and D agency tends to create unrealistic expectations, albeit unwittingly, and when it backs away, as it inevitably must, its credibility suffers correspondingly.

4. Credibility with the Researched

Finally, it should be noted, that research agencies encounter serious problems in maintaining their credibility with the persons and institutions who become the subjects of research. Native peoples, the poor, welfare recipients, and other like groups claim that they have been "researched to death" and they have begun to resist researchers. Similarly, schools, hospitals, correctional institutes, and so on claim that their work is seriously impeded by the questionnaires, interviewers, and observers that research agencies impose upon them.

Such negative attitudes on the part of the researched can be explained on several grounds: (1) Seldom are the guarantees of confidentiality adequate; hence, the subject, reasonably enough, chooses to protect his right to privacy in his own way—by declining to cooperate. (2) Frequently, the potential use of the research is not made clear to the subject; hence he acts in his own way to protect his time—by declining to cooperate. (3) Often too, there is little if any feedback from the researcher to the researched; hence, the individual or the institution is again inclined to act in his own way to avoid being “used.”

Clearly, this is a problem of *research ethics*. To disregard the rights of subjects to personal privacy, to an understanding of the purposes of research, or to a share of the products of research, is, at best, to regard them simply as “guinea pigs.” From a purely ethical point of view, this must be condemned as shoddy behaviour. From a practical research point of view, it must be condemned as the kind of action that destroys the laboratories in which social scientists must work.

The Future

Given the host of problems identified here, most of which remain unresolved or only partially resolved, one must ask: What hopes can one have for the future? Can social policy research and/or the process of R and D be brought to the service of social policy formation and to the resolution of society’s critical problems? Or to put it another way: Can the kind of “quasi non-governmental research agency” that has recently been created to perform that role ever hope to perform its role effectively? If so, under what conditions?

It seems clear that, if these efforts are to succeed, better techniques must be found for mobilizing, utilizing, and controlling resources. To mobilize effectively is to reach out into many institutions of society and attract the appropriate talents; to utilize effectively is to plan and co-ordinate activities in such a way as to make talents complementary to one another; to control is to impose the kinds of constraints that are needed to prevent individuals from attempting to make contributions which they are incompetent to make.

The skills and talents that are required to orchestrate such a venture are difficult to find or develop. But to do so, is the first major task of the R and D agency.

It seems clear also, that if the movement is to succeed, codes of behaviour must be developed to guide the complex web of inter-institutional, inter-disciplinary, and inter-personal relationships that are involved in R and D.

The skills and talents that are required to orchestrate such relationships are also difficult to find or develop. But to do so, is undoubtedly the second major task of the R and D agency.

Can it be done? It simply must.

HRRC PUBLICATIONS

SOCIAL FUTURES ALBERTA 1970-2005

This report summarizes the results of six forecasting exercises. The topics covered in these exercises are as follows: future changes in values and social goal orientations, future of the family, leisure and recreation in the future, intercultural relations in the future, the future of politics, and future needs and problems of the individual. These topics were selected for their relevance to the future of education, though their implications extend far beyond education. This study was conducted by the Westrede Institute under the direction of Harold J. Dyck, with special assistance from George J. Emery. Price, three dollars.

ECONOMIC AND DEMOGRAPHIC FUTURES IN EDUCATION, ALBERTA 1970-2005

This study considers probable levels in distribution of Alberta's population from 1970-80 and from 1980-2005, and explores the implications of these population data for enrolment at various levels of education. Also considers the growth potential of the Provincial economy, its implications for Provincial Government revenues, and the relationship between these revenue projections and potential educational costs. By Don Seastone. Price, five dollars.

THE FUTURE AND EDUCATION, ALBERTA 1970-2005

This is the last in a series of studies on the future of Alberta, and of education in Alberta, published by the Human Resources Research Council. Background work which led to the publications was undertaken by the Human Resources Research Council with the support of the Commission on Educational Planning. "Social Futures Alberta, 1970-2005" and "Economic and Demographic Futures in Education, 1970-2005" are two other publications in the series. This last study surveys some of the major findings of those which preceded it, analyzes their social implications, and proposes some educational responses. The study was written by Dr. Harold S. Baker, with the assistance of members of the staff of the Human Resources Research Council. Price, three dollars.

SOCIAL GOALS, EDUCATIONAL PRIORITIES, AND DOLLARS: PLANNING EDUCATION IN THE SEVENTIES

Proceedings of the Conference on Educational Planning sponsored by the Alberta Human Resources Research Council and the Canadian Council for Research in Education, October 18-21, 1970. Includes papers on Social Research and Public Policy, The Need to Plan, Contemporary Approaches to Planning in Education. Edited by J. A. Riffel and E. Miklos. No charge.

EDUCATIONAL PLANNING REEXAMINED

This monograph offers a comprehensive survey of educational planning as it has been and as it might be. The author states that "my concern is with characterizing educational planning, not as it has been, but as it can become." Major topic headings include: Lessons of the

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RESEARCH REPORT—A REVIEW OF EDUCATIONAL
OPPORTUNITY, ALBERTA, 1970

Early in 1971, the Human Resources Research Council sponsored the preparation of a series of resource papers on various aspects of life in Alberta. One of the papers in this series, written by E. J. Ingram and L. W. West, examines the state of educational opportunity in Alberta as it was in 1970. The report is divided into four major sections entitled: “The Assessment of Opportunity”; “A Review of the Educational System”; “Additional Data Needs”; and “Policy Issues”. Topics discussed by the authors in the report include: present modes of assessing opportunity; emerging trends in educational thought and policy; indicators of educational opportunity; and a review of the educational system (from kindergarten through post-secondary) in terms of institutions, programs, enrolment and costs. Price, one dollar.

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